MANUAL OF WATER WORKS ACCOUNTING

Prepared by the
MUNICIPAL FINANCE OFFICERS ASSOCIATION
and the
AMERICAN WATER WORKS ASSOCIATION

Published jointly by the
MUNICIPAL FINANCE OFFICERS ASSOCIATION
CHICAGO
and the
AMERICAN WATER WORKS ASSOCIATION
NEW YORK

PRINTED AND BOUND IN THE UNITED STATES OF AMERICA BY
KINGSPORT PRESS, Inc., Kingsport, Tennessee

SECOND PRINTING — 1951, PHOTOLITHOPRINTED AND BOUND BY
CUSHING - MALLOY, Inc., Ann Arbor, Michigan

PREFACE

Although much had been written on the various phases of water works accounting, no single book integrating all of this material existed. It was for this reason that the Municipal Finance Officers Association, in the fall of 1936, undertook in conjunction with the American Water Works Association the preparation of a manual treating of water works accounting and of some phases of financial administration related to accounting and presented from the standpoint of the water plant operator.

The manual is intended for both private and municipal plants, since from the viewpoint of the operator the accounting procedure is the same for both types of plants. It should be valuable to those who want information regarding the financial condition and financial operations of a water plant. It has been designed to be helpful as an administrative guide for those who look upon accounting not as an end in itself but as a tool of administration. Private accountants who install utility accounting systems or who act as consultants for utility plants will also find the manual a valuable guide.

The manual represents a suggested basis for adequate accounting agreed upon, as to content, by the Municipal Finance Officers Association and the American Water Works Association. The book is not intended to be an exposition of the only way to do a particular job. As a matter of fact, alternative procedures are suggested in various places throughout the text. But not all possible alternatives have been considered, since such treatment would have made the manual unduly lengthy and complicated. Rules or procedures should not be applied indiscriminately; they must be adapted to the needs of particular situations. The procedures described here are no exception. At the same time it should be kept in mind that the manual has been prepared in accordance with sound accounting principles and that the procedures described will be found workable.

The preparation of the manual was under the immediate supervision of a committee of the American Water Works Association of which HAL F. SMITH, Department of Water Supply, Detroit, Michigan is chairman, and of a committee of the

Municipal Finance Officers Association headed by M. F. HOFFMAN, Commercial Superintendent, Department of Water Works, Cincinnati, Ohio. Names of committee members will be found listed elsewhere. The original draft was prepared by CHARLES T. SWEENEY, C.P.A. of Springfield, Ohio and IRVING TENNER, Staff Accountant of the Municipal Finance Officers Association. The draft was reviewed by the accounting manual committees of both organizations and their suggestions and recommendations carefully considered before presentation of the document for final approval by the two organizations. It is the intention of the two associations to make such revisions from time to time as the practical application of the manual might indicate to be desirable.

Grateful acknowledgment is hereby made to the members of the American Water Works Association and the Municipal Finance Officers Association, and to other interested persons who reviewed the original draft or supplied essential information. Without their help, the manual would not have been possible.

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September 1, 1938

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CHAPTER 1

INTRODUCTION

Purpose of Manual

The purpose of this manual is to outline a practical accounting system and an effective accounting procedure for both municipal and private water works plants. The aim of accounting is to supply financial information. A good accounting system is one which provides for recording financial data in such manner that they can be utilized effectively as a guide in managing the utility plant, as a basis for determining the fidelity of persons administering water works funds, and as a means of informing public service commissions, creditors, stockholders, municipalities, and customers, of the utility's financial condition and operations.

Certain phases of utility operation would indeed be difficult, if not impossible, without the aid of financial information. For example, a utility's budget, to be workable, must be based on past experience, as contained in the financial statements of prior years. The importance of financial data to the customer accounting department of a modern water works plant is unquestioned. If officials of that department are to enforce collections, they must be currently informed of collections and delinquencies. It is also highly important that operating executives be informed of the cost of carrying on the particular phase of the utility's activity under their supervision. The management must know the financial condition of the utility and of the changes in financial condition.

Under a good accounting system, it is possible for outside auditors to determine readily whether all funds have been properly accounted for, and all transactions handled, in accordance with sound accounting principles. Auditors' reports are highly important since they represent the opinion of impartial investigators. They are relied upon by owners—whether stockholders, the operating municipality, or customers—by present and prospective creditors, and frequently, in connection

with rate making, by public service commissions and courts. Unless proper records are kept, the work of the auditors in preparing reports is made difficult and, therefore, costly.

Although public service commissions prescribe the system of accounts to be kept by most private water utilities, they do not attempt to outline the procedure to be followed in accumulating the financial information. An important part of a good accounting system is provision for the flow of data to the accounts with the minimum amount of clerical work and error. Accordingly, it is hoped that this manual may prove to be of value to both private and municipal water utilities. In adopting the system and procedure described here, a water works plant is in a position to provide the proper financial information in a form which will make possible its utilization by the various interested parties.

While the manual is concerned primarily with accounting principles and procedure, certain phases of administration are also considered. On the whole, however, only those phases of administration which affect accounting procedure are discussed. Particular attention is paid to financial administration.

Classes of Utilities

The manual is applicable to all classes of utilities. The National Association of Railroad and Utilities Commissioners distinguishes between two classes of utilities, as follows:

> "Class A. Utilities having annual water operating revenues of $250,000 or more. . . .
>
> Class B. Utilities having annual water operating revenues of more than $100,000 but less than $250,000. . . .
>
> The class to which any utility belongs shall be determined by the average of its annual water operating revenues for the three years next preceding the effective date of this system of accounts. If at the end of any calendar year following the effective date of this system of accounts the annual water operating revenues of the utility for the three years ended on that date shall average $250,000, then such utility shall be classified as a Class A utility for the next succeeding year." [1]

[1] National Association of Railroad and Utilities Commissioners, Committee on Statistics and Accounts of Public Utility Companies. *Uniform System of Accounts for Water Utilities (Classes A and B)*, November 27, 1937, p. 6. This draft was approved in preliminary form at the Association's 1937 convention. It will be submitted for final approval by the Association at its convention in November, 1938. Pending final approval, the draft represents the recom-

While the Association has made no attempt to classify utilities below Class B, such utilities might possibly be classified further into those having annual operating revenues of more than $50,000, but less than $100,000, and those having annual operating revenues of less than $50,000. The former will hereafter be referred to as Class C utilities, the latter as Class D.

Although the manual is more directly applicable to utilities falling within Class B, other classes should, except for the necessity of making minor adjustments, find it just as useful. Utilities falling in Class A will probably find that some of their records need to be more extensive than outlined here and that some slight variation in procedure may be needed because of the size of the organization and the remoteness of control. On the other hand, Classes C and D utilities, because of their limited activities, may find that some of their records need not be as elaborate as here described and that they can operate under a somewhat simpler procedure.

Private and Municipal Plants

As indicated above, the manual is intended for both private and municipal water works. From an operating standpoint, it makes little difference whether a water works plant is privately or municipally owned. The cost of operations should, under like circumstances, be the same for each plant; both utilities should strive to give the customer efficient service at the lowest possible cost. All factors which go into the operation of a water works plant should be taken into account in comparing the cost of operating a municipal plant with the cost of operation of a private plant.

There are, however, some respects in which the private water utility differs from a municipal utility. These differences have been duly recognized in the manual. Some of them are as follows:

1. Delinquent accounts of municipal utilities are frequently made a lien on the property served while those of private utilities are seldom a lien.

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mendations of the Association's Committee on Statistics and Accounts of Public Utility Companies. Upon approval, the classification will be published by the State Law Reporting Company, 30 Vesey Street, New York City.

2. The rates of private utilities are usually subject to the approval of a state public service commission.
3. The quality of service rendered by a private utility is more frequently subject to the supervision of a state public service commission.
4. Private utilities are required to adopt a uniform classification of accounts, prescribed by the state public service commission of their state, and to report to that body. Municipal utilities are less frequently subject to such requirements.
5. The sources of capital used in financing the acquisition of a water utility differ in each case. In the case of private water utilities, capital is obtained primarily through the sale of stocks and bonds. The acquisition of the municipal plant, on the other hand, may be financed by the sale of bonds to be retired from the income of the utility or by contributions from the municipality which may be either in the form of a cash grant or an issuance of utility bonds to be paid by the municipality from general taxes.
6. The form of organization of the two is different. A private water utility is usually organized as a corporation and governed by a board of directors elected by the stockholders. A municipal utility, on the other hand, is owned by the municipality in which operated, and may be governed by a special committee of the city council or by a special board or commissioner either elected by the people or appointed by the city council or mayor.
7. A municipal utility in reality constitutes but one department of the municipality. There is a definite relationship between this department and other departments of the city, which relationship, as indicated subsequently, affects the utility's accounting procedure and has a bearing on the utility's finances. On the other hand, some private utility companies each operate a number of utilities, in which case, the individual branches bear a somewhat similar relation to the parent company as that borne by the city water department to the city.
8. Municipal utilities are subject to legal budgetary restrictions.
9. Municipal utilities frequently do not have to incur certain

expenditures, such as, for example, taxes. On the other hand, they are, in many instances, forced to render free services.

Relationship to Requirements Set Up by National Association of Railroad and Utilities Commissioners

In view of the fact that most of the private water utilities are subject to regulation by state public service commissions and that the requirements of such commissions are based for the most part on the recommendations of the National Association of Railroad and Utilities Commissioners, the recommendations of the latter body have been generally followed in the preparation of this manual. Although most municipal water utilities are not subject to state commission regulation, they might find it advisable to follow these recommendations, because, in the first place, the recommendations are generally in accordance with sound accounting principles, and secondly, common terminology and common accounting treatment of similar transactions by all water works is highly desirable. Otherwise, not only will comparative statistics be out of the question, but erroneous interpretations might be attached to a municipal utility's financial statements.

Every utility, unless subject to the supervision of a state public utility commission, might profitably secure, and make use of, the *Uniform Classification of Accounts for Water Utilities,* recommended by the National Association of Railroad and Utilities Commissioners.[2] Although an attempt has been made to indicate, by means of journal entry illustrations, the debit and credit postings to be made to each account, exigencies of space rendered impossible the inclusion in the manual of every conceivable transaction.

Basis of Accounting Followed

There are two bases of accounting, cash and accrual. Under the cash basis, revenues are considered as such when actually received, and expenditures are charged when cash is paid out. Under the accrual basis, revenues are recorded as soon as earned, regardless of when collected, and expenditures are recorded as soon as incurred, regardless of when payment is made. The

[2] See footnote, page 4.

following illustration indicates the distinction between the two bases: Assume that a carload of coal was purchased on credit and received and used during December, but was paid for in January of the following year. Under the cash basis of accounting, the expenditure will not be recorded until the coal is paid for, that is, in January. Under the accrual basis, the expenditure will be recorded in December.

It is evident from the foregoing illustration that the accrual basis is the more accurate of the two. Under the cash basis, although the coal is used in December, it is not recorded as an expenditure until January of the next year. To get an accurate profit or loss figure for an accounting period, it is essential that all the revenues and expenditures for the period be recorded. This can be readily accomplished under the accrual basis. Under the cash basis, however, unless all revenues are collected during the period and all expenditures paid for, some of the revenues and some of the expenditures will not be entered; at the same time, revenues applicable to prior years but collected during the current year, and expenditures applicable to prior years but paid for during the current year, would be included.

Since the accrual basis of accounting is the more accurate, it is recommended that all water works accounting systems be established on this basis. The illustrative entries and the discussion in this manual are based on the assumption that the accrual basis of accounting is employed.

General Plan of Manual

The manual is arranged in five parts. *Part I* is devoted to a discussion of the accounting system, including the principles along which the accounting department should be organized, the accounts to be set up, the books of original entry to be kept, and the accounting documents involved in recording accounting transactions.

Part II is devoted to customer accounting and collecting; it consists of two chapters, the first of which deals with customer accounting procedure up to time of billing, and the second with billing, collecting, and bookkeeping.

Part III is concerned with accounting for expenditures, the first chapter dealing with purchasing procedure and accounting

for purchases, the second with accounting for materials and supplies used, and the third with payroll accounting. A separate chapter is devoted to expenditures incurred for contractual services, interest on notes payable, and taxes. Depreciation accounting and the distribution of expenditures recorded in clearing accounts, are each treated in a separate chapter. The last chapter treats of cost accounting.

Part IV deals with accounting for assets, liabilities, and net worth. Particular attention is paid to the handling of, and the accounting procedure for, cash, restricted funds, and investments, and the proper accounting procedure required for maintaining a complete and accurate record of all fixed assets. The accounting procedure for bonds outstanding is discussed in detail. The accounting treatment for capital stock of private water utilities, and of the municipality's equity in the case of municipal utilities, is also considered.

Part V deals with the preparation and use of financial statements. The procedure to be followed in the preparation of financial statements is outlined. The kinds of statements to be included in both monthly and annual financial reports are listed and illustrated. The last chapter deals with budgeting.

CHAPTER 2

ACCOUNTING ORGANIZATION AND CONTROL

Introduction

Organization for accounting control is but one aspect of general organization for carrying on the activities of the utility. Furthermore, the degree to which accounting control can be exercised will depend somewhat on the general organizational set up. In order to discuss accounting organization and control, the whole organization structure of the utility must be examined. Before proceeding to do that, however, it will be helpful to note the relationship of accounting to control.

Relationship of Accounting to Control

The accounting system provides the means whereby control over the utility's activities may be exercised. Such control may be classified into three parts:

1. *Control by those who determine general policies.* General policies are formed by stockholders in the case of privately owned water utilities and the voters and the city council (where administrative policies are not determined by it) in the case of municipally owned utilities.
2. *Control by those who formulate administrative policies.* Administrative policies are determined by the board of directors of the privately owned utilities and the city council, city commission, or specially elected or appointed water boards in the case of municipally owned utilities.
3. *Control by those who supervise actual operations.* Actual operations are under the jurisdiction of the manager, superintendent, or other designated officer who is directly responsible for the operation of the utility.

While there may be some variations, the first group, generally speaking, holds the second group responsible for the successful management and operation of the utility, and the second group

holds the general manager or superintendent responsible. The latter may in turn delegate some authority to sub-executives, each of whom is in charge of a particular operation, and hold them responsible for proper execution. In a small utility, however, the general superintendent probably supervises personally each operation.

Financial information is essential to each type of control mentioned above. Unless the accounting system is properly set up, the necessary financial information may not be furnished promptly enough to be of use, may be incomplete or inaccurate, and may cost too much to compile.

Organization of a Utility

It was previously pointed out that the organization structure of a utility will vary somewhat depending on whether the utility is privately or municipally owned. The main differences, however, lie in the exercise of control over general and administrative policies. The organization for carrying on actual operations need not be materially different in each instance, and such differences as do exist arise primarily from the fact that some of the functions which a private utility fulfills by itself are performed for the municipal utility by other city departments.

In general, it is important to remember that while the municipal utility should be considered an independent enterprise, it has, at the same time, certain relationships with other departments. Such relationships may be classified as follows: (1) that arising from the rendering of service by other departments for the utility, (2) that arising from the rendering of service by the utility to other departments, and (3) that arising from the fact that other departments may be carrying on work of which the utility should be informed and on which they possibly should be consulted.

1. *Service rendered by other departments for utility.* The services frequently rendered by city departments for the utility are those generally known as staff services and consist of the following: (1) personnel, (2) purchasing, (3) treasury management, (4) accounting, and (5) legal. Services rendered to the utility by the municipality in connection with personnel administration include: (1) setting up standards on the basis of which the fitness of individuals for particular jobs may be

determined, (2) recruiting applicants, (3) determining which of the applicants conform to the standards set up, (4) designating rates of pay which each position should carry, (5) keeping a personnel record of employees, (6) providing a system by which efficiency of employees can be determined, and (7) providing for the establishment of incentives for increasing efficiency.

Purchasing services, as the name implies, involve the purchasing of commodities for the utility by a central city purchasing department and, in the case of certain supplies, storage until such time as needed by the utility.

Treasury management involves the custody of funds and their proper investment. In the case of small municipal utilities, the city treasurer may act also as collection agent for the utility. Accounting services rendered by the general accounting office to the utility vary. In some cases the general accounting office keeps only the controlling accounts of the utility. In small utilities, on the other hand, billing of, and accounting for, collections from individual customers may be performed by the general accounting office. Another accounting service which the general accounting office frequently performs for the utility is the preparation of payrolls.

Other services include the rendering of legal service by the city's legal department, the use of office space in the city hall by the utility, the use of the city garage for storage of utility equipment, and the repair of utility equipment in the city's shops.

2. *Services rendered by the utility for other departments.* The services rendered by the utility for other departments consist primarily of supplying water to departments. In addition, in small communities, both office and transportation equipment of the utility may be used by other departments.

3. *Informing and consulting the utility with reference to work carried on.* The utility has a definite interest in some of the work carried on by other departments. This is particularly true of the work of the public works department. For example, the utility should be informed of contemplated new paving so that mains may be laid before paving is begun. The utility management should also be consulted in connection with community planning since the water supply may affect planning.

Activities connected with fire protection are also of interest to the utility. It should be noted, however, that the discussion in this paragraph is equally applicable to private utilities.

Most of these relationships are important from an accounting standpoint in that they have a direct bearing on the cost of rendering service. If the cost of operating the utility is to be determined accurately, the utility must recognize the cost of the services performed for it by other departments and must be paid for services rendered by it for other departments.

Where a private water utility operates several branches, some staff services may also be rendered for such branches by the parent company. In that respect, the parent company bears somewhat the same relationship to its branches as the city departments do to the water utility. The difference arises primarily in the fact that the parent company is usually located at a distance from some of the branches and, consequently, may not be in a position to render as many staff services as does a municipality. The important point is the necessity of allocating, among the branches benefited, the cost of service rendered by the parent company.

Organization for Carrying Out the Accounting Function

To insure effective, prompt, and accurate performance of activities connected with accounting, certain principles should be observed in organizing the accounting office. These relate primarily to the assignment of duties to employees, and while some are applicable to all activities, others relate primarily to accounting. The first class may be referred to as general principles and the second class as principles relating to internal check or control.

1. *General Principles.* Some of the general principles of organization for carrying out the accounting function include:

   a. Setting up definite lines of authority and responsibility. Unless this is done, there is likely to be confusion and duplication of work.
   b. Informing each employee as to what his duties are and how his work ties in with the general working procedure of the organization.
   c. Supplying employees with the materials and equipment essential to the performance of activities.

d. Planning carefully the working procedure.
e. Preparing a manual of office procedure and placing a copy in the hands of each employee.

2. *Principles of Internal Check.* Internal check is defined as "an accounting method or procedure so designed that the work of one employee is complementary to that of another, thus providing a continuous audit by the employees on the accuracy of their accounting work."[1] For example, under a system of internal check "the duties of employees charged with the physical custody and handling of cash, securities, etc., are so divided from the duties of employees charged with the keeping of records (other than the cash book) as to prevent the perpetration of irregularities and their permanent concealment in the records, and to reduce the possibility of collusion to the minimum. Such a system makes it very difficult for a single employee to misappropriate cash or other assets and doctor the records so as to conceal the transaction effectively."[2]

Indication will be made in later chapters of the specific procedure to be followed to insure the effective operation of the system of internal check. Here only the distribution of work among the various employees will be pointed out. The principles set forth below are but a further elaboration of the general definition and example cited in the preceding paragraph. Only those procedures which require the greatest control are discussed below. These include the handling of (a) accounts receivable, (b) cash, (c) materials and supplies, and (d) payrolls.

a. *Control over Receivables*
   (1) Meter readers should have nothing to do with either billings or collections. Routes of meter readers should be changed occasionally. Even where consumption is recorded by the meter reader, such consumption should be checked by employees in the billing division.
   (2) Billings should be proved by persons other

[1] See Appendix 1, page 451.

[2] P. D. Williams, "Internal Audit and Control," *Journal of the American Water Works Association,* October 1937, V. 29:1566–77. This article was relied on in part in the preparation of the last part of this chapter.

than those doing the actual billing. Methods of proving that all customers have been billed and that billings are in general accurate, are discussed in Chapter 6.

(3) Persons making entries to the individual customers' accounts should not make entries for posting to the accounts receivable control account. The balancing of customers' ledgers to the control accounts should be checked by employees who have nothing to do with keeping accounts receivable records.

(4) Persons keeping the accounts receivable records should have nothing to do with the collection or handling of cash. Neither should such persons be permitted to make allowances. All adjustments on accounts, including the writing off of uncollectible accounts, should be approved in writing by an authorized official.

b. *Control over Cash*

(1) All incoming mail should be opened by a responsible employee.

(2) Receipts over-the-counter are frequently recorded by the receiving tellers through the use of cash registers. The tellers should have no access to register tapes or recording mechanisms, and occasional checks should be made by employees outside of the cashier's department of the tape totals with the amount reported as received by the cashiers and as recorded in the Cash Receipts Register.

(3) Neither the cashier nor any employee in his department should have access to any of the customers' accounts. Employees having anything to do with keeping such accounts should not be used as relief cashiers.

(4) All checks should be signed by a high ranking official after he has satisfied himself that the disbursement is in order.

(5) Miscellaneous funds, such as unclaimed wages, key deposits, etc., should not be placed with the regular cashiers. Such funds should be deposited in a bank; but if, for any reason, it is not deemed advisable to deposit them, they should be placed in the custody of persons who do not have access to general cash.

(6) Bank reconciliation statements should be prepared by persons who are not employees of the cashier's department and who do not sign checks.

(7) Securities should be under the control of at least two executives, and access thereto should not be permitted to one of them except in the presence of the other. The executives should represent different departments, as, for example, the accounting and treasury departments.

c. *Control over Materials and Supplies*

(1) The person authorizing the purchases should not act also as receiving clerk. Nor should the person acting as receiving clerk have the authority to approve invoices for payment.

(2) Materials and supplies should be in the custody of a storekeeper who should make issues only upon a requisition signed by the persons authorized to do so.

(3) Physical inventories should be taken at regular intervals under the supervision of a representative of the accounting department. All adjustments to bring the book inventories into agreement with the physical inventories should be approved by a responsible official.

d. *Control over Payrolls*

(1) As far as possible, the hiring of employees, the preparation of payrolls, and the preparation and distribution of pay checks or pay envelopes, should be handled by separate employees or groups of employees.

(2) No changes in the payroll records should be made without authorization of the personnel department.

(3) The payroll should be approved by the controller or other responsible official.

(4) Pay checks or pay envelopes should, wherever possible, be turned over to employees by the paymaster. Foremen or timekeepers should usually not be permitted to distribute them; but where they are allowed to do so, occasional spot checks by a member of the accounting department should be made.

(5) A check of payrolls should be made at frequent intervals by a person having nothing to do with hiring employees, preparation of the payroll, or the distribution of pay checks or envelopes.

It is evident that the extent to which a system of internal check can be installed will vary with the size of the utility. Obviously, there are not sufficient employees in the small utility to make possible the division of work outlined above. On the other hand, in such a utility the manager can exercise personal supervision, and the need for a system of internal check is not so great as in the case of the large utility where there is considerable remoteness of control. However, this does not mean that a system of internal check is not highly desirable even in a small utility, since personal supervision may fail to prevent abuses if the system does not operate properly. To the extent that the number of employees permits, therefore, a system of internal check should be established, particularly with reference to those activities where abuses are most likely to occur. Examples of such activities are the handling of cash and securities.

Another important point to remember is that even where a system of internal check has been established, continual supervision is needed to see that the system is working smoothly. The five general organization principles discussed previously are useful in this connection. Particular attention is called to the fifth principle enumerated there, namely the preparation of a manual of procedure. In the case of the accounting office, a

manual should set forth "a chart of the accounts, including a description of the nature or purpose of the individual accounts and of the type of items to be charged or credited to each, and . . . the procedures to be followed in handling and recording the various types of transactions, together with the duties and responsibilities of each department or position."[3]

[3] Williams, *op. cit.*, p. 1568.

CHAPTER 3

THE ACCOUNTS

Introduction

In the preceding two chapters the accounting system and procedure were discussed from the standpoint of controlling the activities of employees. Consideration will now be given to the accounting system itself and to the media through which financial information is gathered. These media include accounts, records, and documents. The flow of accounting information, starting with the original documents and ending with the financial statements, is illustrated in Chart I.

This chapter is concerned with the selection of the proper classification of accounts and with the arrangement of the various groups of accounts in the books. The succeeding chapter treats of the journals or registers in which the data are summarized for posting to the accounts, and of the documents which form the basis for the entries in these books. The last part of that chapter is devoted to an illustration of the procedure, and the entries involved, in opening the books of a new water utility.

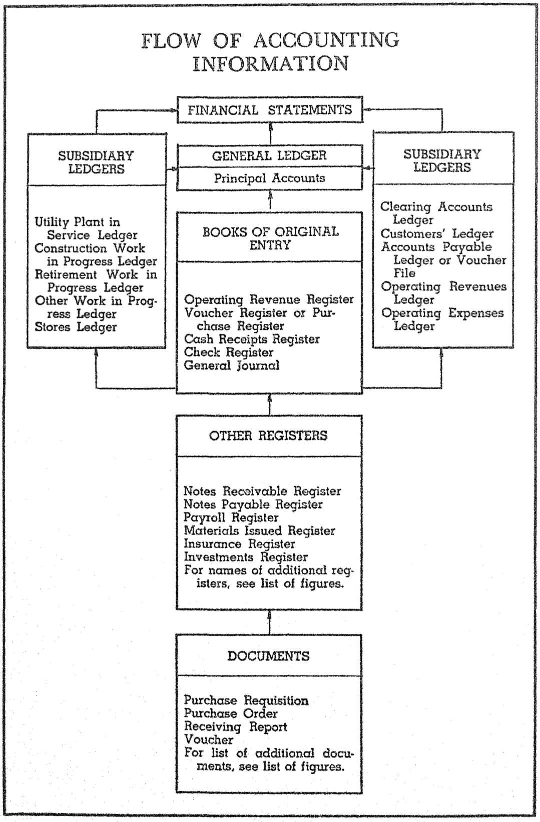
Classification of Accounts

Accounts should be so classified that they can be used readily in the preparation of financial statements. Statements are prepared for the purpose either of showing the financial condition of the water utility at a certain date or of showing the results of operation for a certain period and how these results were obtained. The former type of statement is known as a balance sheet, and the latter as an income, or profit and loss, statement. Accounts may thus be classified as balance sheet or income accounts depending on the statements which they go to make up.

Relationship between Balance Sheet and Income Accounts

Although a distinction must be made between balance sheet and income accounts, the relationship between the two groups

CHART I


FLOW OF ACCOUNTING INFORMATION
FINANCIAL STATEMENTS
SUBSIDIARY LEDGERS
Utility Plant in Service Ledger
Construction Work in Progress Ledger
Retirement Work in Progress Ledger
Other Work in Progress Ledger
Stores Ledger
GENERAL LEDGER
Principal Accounts
SUBSIDIARY LEDGERS
Clearing Accounts Ledger
Customers' Ledger
Accounts Payable Ledger or Voucher File
Operating Revenues Ledger
Operating Expenses Ledger
BOOKS OF ORIGINAL ENTRY
Operating Revenue Register
Voucher Register or Purchase Register
Cash Receipts Register
Check Register
General Journal
OTHER REGISTERS
Notes Receivable Register
Notes Payable Register
Payroll Register
Materials Issued Register
Insurance Register
Investments Register
For names of additional registers, see list of figures.
DOCUMENTS
Purchase Requisition
Purchase Order
Receiving Report
Voucher
For list of additional documents, see list of figures.

must also be kept in mind. Balance sheet accounts are divisible into three groups: assets, liabilities, and net worth. Assets represent real property and property rights which are of value to, and are owned by, the enterprise. Liabilities indicate amounts owed to outsiders. Net worth represents the equity of the owners in the enterprise. If the amount owed outsiders is deducted from the assets owned by the enterprise, the resulting net assets show the amount belonging to the owners—the sum of such assets being equal to the net worth. In other words, assets equal liabilities plus net worth.

The results of operations are reflected in the profit or loss figure. If the operations result in a profit, the latter, since profit goes to the owners, is added to net worth; on the other hand, if the operations result in a loss, net worth, since the owners are the first to stand losses, is reduced correspondingly. The income and expense accounts, therefore, tie in with the balance sheet through their effect on net worth.

Double Entry Method

To understand fully the significance of the relationship between balance sheet and income accounts, as well as the relationship between the accounts within each of these groups, it is essential to have some knowledge of the double entry method of recording transactions. Every account is divided into at least two parts, respectively known as the debit and credit sides. The debit side is usually the left-hand side of the account, and the credit side the right-hand side. Under the double entry method, a balance is maintained between two opposite groups of accounts: that is, the total of the debit balances equals the total of the credit balances. This result is accomplished by providing that every time an entry is posted to the debit side of an account, a corresponding entry or entries must be made to the credit side of another account or accounts.

The following rules illustrate why total debit balances equal total credit balances, and can serve as a practical guide in recording transactions.

1. Transactions resulting in postings to the debit side of an account or accounts:
   a. Increase in assets

b. Decrease in liabilities
c. Decrease in net worth
  (1) Increase in expenses
  (2) Decrease in income
  (3) Losses
  (4) Distribution of net worth
2. Transactions resulting in posting to the credit side of an account or accounts:
  a. Decrease in assets
  b. Increase in liabilities
  c. Increase in net worth
    (1) Increase in income
    (2) Decrease in expenses
    (3) Profits
    (4) Other additions to net worth

The illustrations shown in Chart II should help in visualizing the procedure: Assume that a piece of equipment was purchased for $10,000 and paid for in cash. The result of this transaction will be an increase in the asset "Equipment" and a decrease in the asset "Cash." Consequently, $10,000 will be posted to the debit (left-hand) side of the "Equipment" account, and $10,000 to the credit (right-hand) side of the "Cash" account. The same reasoning applies to the other illustrations shown in Chart II.

Prescribed and Recommended Classification of Accounts

The accounts to be kept by a private utility are usually prescribed by the public service commission of the state in which the utility operates. Some states also require their municipal plants to follow a prescribed uniform system of accounts. Where no system is prescribed, it is recommended that the classification of accounts set forth herein be followed. This classification is, with a few exceptions, based on the recommendations of the Committee on Statistics and Accounts of Public Utility Companies of the National Association of Railroad and Utilities Commissioners.[1]

The classification illustrated in this chapter is applicable to Classes A and B utilities; a classification of accounts suitable for

[1] See footnote, page 4.

Chart II

ENTRIES AND POSTINGS UNDER DOUBLE ENTRY METHOD

Transaction	Effect of Transaction		Postings	
			Debit	Credit
Purchase of equipment for $10,000 in cash	Increase in asset (Equipment)	Decrease in asset (Cash)	Equipment, $10,000	Cash, $10,000
Accounts payable of $20,000 paid	Decrease in liability (Accounts Payable)	Decrease in asset (Cash)	Accounts Payable, $20,000	Cash, $20,000
Bank loan of $100,000	Increase in asset (Cash)	Increase in liability (Bank Loan)	Cash, $100,000	Bank Loan, $100,000
Labor expense $15,000 paid in cash	Increase in expense (Labor)	Decrease in asset (Cash)	Labor, $15,000	Cash, $15,000
Billings for water services $100,000	Increase in assets (Accounts Receivable)	Increase in income (Operating Revenues)	Accounts Receivable, $100,000	Operating Revenues, $100,000
Dividend of $75,000 declared	Decrease in net worth (Surplus)	Increase in liability (Dividends Payable)	Surplus, $75,000	Dividends Payable, $75,000

Classes C and D utilities is shown in Appendix 3. The latter classification was constructed by combining some of the accounts illustrated in this chapter. Neither of the classifications includes budgetary accounts, which are discussed in Chapter 20, dealing with budgeting. The classifications discussed in this chapter are divided into two main groups, the first consisting of balance sheet accounts, the second of income accounts.

Balance Sheet Accounts

As indicated before, balance sheet accounts may be classified as asset, liability, or net worth accounts. Within each of these groups the accounts may be further classified. Thus, asset accounts may be grouped in accordance with what they represent: fixed assets, current assets, deferred debits, etc. Similarly, liability accounts may be classified as long-term debt, current

liabilities, deferred credits, etc. These sub-groups are indicated in the classification of balance sheet accounts illustrated below.

BALANCE SHEET ACCOUNTS *

Assets and Other Debits

A. Utility Plant

100	Utility Plant
100.1	Utility Plant in Service (See I on page 29.)
100.2	Utility Plant Leased to Others
100.3	Construction Work in Progress (See II on page 30.)
100.4	Utility Plant Held for Future Use
100.5	Utility Plant Acquisition Adjustments
100.6	Utility Plant in Process of Reclassification
107	Utility Plant Adjustments

B. Investment and Fund Accounts

110	Other Physical Property
111	Investments in Associated Companies or * Loans to Operating Municipality
112	Other Investments
*112.1	Investments—Par Value
*112.2	Unamortized Premiums on Investments
*112.3	Unamortized Discounts on Investments
*112.4	Accrued Interest on Investments Purchased
113	Sinking Fund
*113.1	Sinking Fund Cash
*113.2	Sinking Fund Investments—Par Value
*113.3	Accrued Interest on Sinking Fund Investments Purchased
*113.4	Unamortized Premiums on Sinking Fund Investments
*113.5	Sinking Fund Interest Receivable
*114	Pension Fund
*114.1	Pension Fund Cash
*115	Depreciation Fund
*115.1	Depreciation Fund Cash
*115.2	Depreciation Fund Investments—Par Value
*115.3	Accrued Interest on Depreciation Fund Investments
*116	Redemption Fund
*116.1	Redemption Fund Cash
*117	Construction Fund

* All accounts except those starred (*) are the accounts recommended by the Committee on Statistics of Public Utility Companies of the National Association of Railroad and Utilities Commissioners, referred to in the footnote on page 4. Starred accounts represent either those applicable to municipal utilities alone or a further subdivision of the accounts as given in the classification of the National Association of Railroad and Utilities Commissioners. Most of the starred accounts are listed here because such accounts were necessary in connection with the illustrative entries used throughout the manual.

*117.1	Construction Fund Cash
*117.2	Due to Utility—Cr.
118	Miscellaneous Special Funds

C. Current and Accrued Assets

120	Cash
121	Special Deposits
*121.1	Cash with Fiscal Agent
122	Working Funds
*122.1	Change Fund
*122.2	Petty Cash
123	Temporary Cash Investments
124	Notes Receivable
125	Accounts Receivable (See III on page 30.)
126	Receivables from Associated Companies or * Receivables from Operating Municipality
127	Subscriptions to Capital Stock
128	Interest and Dividends Receivable
129	Rents Receivable
130	Accrued Utility Revenues
131	Materials and Supplies (See IV on page 30.)
132	Prepayments
*132.1	Prepaid Rent
*132.2	Prepaid Insurance
*132.3	Prepaid Interest
*132.4	Prepaid Postage
*132.5	Prepaid Taxes
*133	Due from Other Funds
*133.1	Due from Construction Fund
*134	Materials in Transit

D. Deferred Debits

140	Unamortized Debt Discount and Expense
141	Extraordinary Property Losses
142	Preliminary Survey and Investigation Charges
143	Clearing Accounts (See V on page 31.)
144	Retirement Work in Progress (See VI on page 31.)
145	Other Work in Progress (See VII on page 31.)
146	Other Deferred Debits

E. Capital Stock Discount and Expense

150	Discount on Capital Stock
151	Capital Stock Expense

F. Reacquired Securities

152	Reacquired Capital Stock
153	Reacquired Long-Term Debt

* See footnote, page 24.

Liabilities and Other Credits

G. Capital Stock

200 Common Capital Stock
201 Preferred Capital Stock
202 Stock Liability for Conversion
203 Premiums and Assessments on Capital Stock
204 Capital Stock Subscribed
205 Installments Received on Capital Stock

H. Long-Term Debt

210 Bonds
211 Receivers' Certificates
212 Advances from Associated Companies or *Advances from Operating Municipality
213 Miscellaneous Long-Term Debt

I. Current and Accrued Liabilities

220 Notes Payable
221 Notes Receivable Discounted
222 Accounts Payable or * Vouchers Payable (See VIII on page 31.)
223 Payables to Associated Companies or * Payables to Operating Municipality
224 Dividends Declared
225 Matured Long-Term Debt
226 Matured Interest
227 Customers' Deposits
228 Taxes Accrued
229 Interest Accrued
230 Accrued Rents Payable
*231 Vendor
*232 Due to Other Funds
*232.1 Due to Pension Fund
*233 Accrued Payroll
*234 Contracts Payable
*235 Retained Percentage

J. Deferred Credits

240 Unamortized Premium on Debt
241 Customers' Advances for Construction
*242 Rents Received in Advance
*243 Revenues Received in Advance

K. Reserves

250 Reserve for Depreciation of Utility Plant
251 Reserve for Amortization of Limited-Term Utility Investments

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* See footnote, page 24.

*251.1 Reserve for Amortization of Organization Expense
*251.2 Reserve for Amortization of Franchises and Consents
*251.3 Reserve for Amortization of Leaseholds
252 Reserve for Amortization of Utility Plant Acquisition Adjustments
253 Reserve for Depreciation and Amortization of Other Property
254 Reserve for Uncollectible Accounts
255 Insurance Reserve
256 Injuries and Damages Reserve
257 Employees' Provident Reserve
*258 Reserve for Unclaimed Wages
*259 Reserve for Retirement of Sinking Fund Bonds
*260 Reserve for Redemption of Preferred Capital Stock
*261 Reserve for Construction Fund
*262 Reserve for Investment Losses

*L. Contributions in Aid of Construction and * Municipal Equity*

265 Contributions in Aid of Construction
*266 Municipal Equity

M. Surplus

270 Capital Surplus
271 Earned Surplus (See page 35 for subsidiary accounts.)

Income Accounts

The following is a classification of income accounts. Two important facts should be noted about this classification. One is that many of the accounts are in turn supported by detailed subsidiary accounts, and the other that some of the accounts (as, for example, Operating Revenue Deductions) are not numbered. These items are really not accounts but merely statement headings.

INCOME ACCOUNTS

A. Utility Operating Income

501 Operating Revenues (See page 32 for subsidiary accounts.)
Operating Revenue Deductions:
502 Operating Expenses (See page 32 for subsidiary accounts.)
503 Depreciation
504 Amortization of Limited-Term Utility Investments
*504.1 Amortization of Organization Expense
*504.2 Amortization of Franchises and Consents
*504.3 Amortization of Leaseholds

* See footnote, page 24.

505 Amortization of Utility Plant Acquisition Adjustments
506 Property Losses Chargeable to Operations
507 Taxes
Total Operating Revenue Deductions
Net Operating Revenues
508 Income from Utility Plant Leased to Others
509 Rent for Lease of Utility Plant
Utility Operating Income

B. Other Income

520 Income from Merchandising, Jobbing, and Contract Work
521 Income from Non-Utility Operations
522 Revenues from Lease of Other Physical Property
523 Dividend Revenues
524 Interest Revenues
525 Revenues from Sinking and Other Funds
*525.1 Revenues from Sinking Fund
*525.2 Revenues from Depreciation Fund
526 Miscellaneous Non-Operating Revenues
527 Non-Operating Revenue Deductions
Total Other Income
Gross Income

C. Income Deductions

530 Interest on Long-Term Debt
531 Amortization of Debt Discount and Expense
532 Amortization of Premium on Debt—Cr.
533 Taxes Assumed on Interest
534 Interest on Debt to Associated Companies
535 Other Interest Charges
*535.1 Interest on Notes
536 Interest Charged to Construction—Cr.
537 Miscellaneous Amortization
*537.1 Amortization of Utility Plant Acquisition Adjustments (See, also, account 505 and page 359.)
538 Miscellaneous Income Deductions
Total Income Deductions
*539 Net Income

D. Disposition of Net Income

540 Miscellaneous Reservations of Net Income
Balance Transferred to Earned Surplus

Controlling and Subsidiary Accounts

The above groups of accounts are known as principal accounts because they make up the principal statements—namely,

* See footnote, page 24.

the balance sheet and the income statement. Some of these accounts are supported by other accounts which give greater detail, the former being known as controlling accounts, the latter as subsidiary accounts. Indication has been made opposite some of the accounts listed on pages 24–27 that they are supported by subsidiary accounts. Each of these is repeated at this point, and, in addition, the subsidiary accounts supporting it are indicated.

I. Utility Plant in Service (Account No. 100.1)

A. Intangible Plant

301	Organization
302	Franchises and Consents
303	Miscellaneous Intangible Plant
*303.1	Leaseholds

B. Tangible Plant

311	Land and Land Rights
311.1	Source of Supply Land and Water Rights
311.11	Water Rights
311.12	Reservoir Land
311.13	Other Source of Supply Land
311.2	Power and Pumping Land
311.3	Purification Land
311.4	Transmission Land and Rights of Way
311.5	Distribution Reservoir and Standpipe Land
311.6	Distribution Land and Rights of Way
311.7	General Land
311.71	Office Land
311.72	Stores, Shop, and Garage Land
311.73	Miscellaneous Land
312	Structures and Improvements
312.1	Source of Supply Structures
312.11	Collecting and Impounding Reservoirs
312.12	Lake, River, and Other Intakes
312.13	Wells and Springs
312.14	Infiltration Galleries and Tunnels
312.15	Other Water Source Structures
312.2	Power and Pumping Structures
312.3	Purification Buildings
312.5	Distribution Reservoirs and Standpipes
312.6	General Structures and Improvements
312.61	Office Buildings
312.62	Stores, Shop, and Garage Buildings

* See footnote, page 24.

*312.621 Stores and Shop Buildings
*312.622 Garage Buildings
312.63 Miscellaneous Structures and Improvements
313 Boiler Plant Equipment
314 Other Power Production Equipment
315 Steam Pumping Equipment
316 Electric Pumping Equipment
317 Oil Engine Pumping Equipment
318 Hydraulic Pumping Equipment
319 Other Power Pumping Equipment
320 Purification System
321 Transmission Mains and Accessories
322 Distribution Mains and Accessories
323 Services
324 Meters
325 Hydrants
326 Fire Mains
327 Other Fire Protection Plant
328 Fountains and Basins
329 Office Furniture and Equipment
330 Transportation Equipment
331 Stores Equipment
332 Shop Equipment
333 Laboratory Equipment
334 Tools and Work Equipment
335 Communication Equipment
336 Miscellaneous Equipment
337 Other Tangible Property
341 Utility Plant Purchased
342 Utility Plant Sold

The above items could apply to most of the other accounts listed under Utility Plant (Account No. 100), but usually pertain to Utility Plant in Service. For this reason they are shown as supporting the latter account.

II. Construction Work in Progress (Account No. 100.3)

This account will be supported by individual work orders. See Chapter 13.

III. Accounts Receivable (Account No. 125)

The subsidiary accounts controlled by this account consist of district or route control summaries, each of which in turn controls the individual customer accounts. See pages 98–105.

IV. Materials and Supplies (Account No. 131)

This account will be supported by the individual perpetual inventory cards. See Figure 55.

* See footnote, page 24.

V. CLEARING ACCOUNTS (Account No. 143)

901 Charges by Associated Companies—Clearing or * Charges by Operating Municipality—Clearing
902 Stores Expenses—Clearing
*902.1 Supervision
*902.2 Labor
*902.3 Materials and Supplies
*902.4 Heat, Light, and Power
*902.5 Depreciation
*902.6 Other Stores Expenses
*903 Stores Expenses—Clearing (Credit)
904 Transportation Expenses—Clearing
*904.1 Supervision
*904.2 Labor
*904.3 Materials and Supplies
*904.4 Heat, Light, and Power
*904.5 Depreciation
*904.6 Other Transportation Expenses
*905 Transportation Expenses—Clearing (Credit)
906 Laboratory Expenses—Clearing
*906.1 Supervision
*906.2 Labor
*906.3 Materials and Supplies
*906.4 Heat, Light, and Power
*906.5 Depreciation
*906.6 Other Laboratory Expenses
*907 Laboratory Expenses—Clearing (Credit)
908 Shop Expenses—Clearing
*908.1 Supervision
*908.2 Labor
*908.3 Materials and Supplies
*908.4 Heat, Light, and Power
*908.5 Depreciation
*908.6 Other Shop Expenses
*909 Shop Expenses—Clearing (Credit)

VI. RETIREMENT WORK IN PROGRESS (Account No. 144)

This account will be supported by individual retirement orders. See pages 351–352.

VII. OTHER WORK IN PROGRESS (Account No. 145)

This account will be supported by individual work orders. See Chapter 13.

VIII. ACCOUNTS PAYABLE OR VOUCHERS PAYABLE (Account No. 222)

Where a voucher system is in use, the Vouchers Payable account should be substituted for Accounts Payable. Accounts Payable will be supported by the records of individual accounts payable, which would usually be

* See footnote, page 24.

kept on account forms ruled similarly to the general ledger account form illustrated in Figure 1. In utilities of Class D, the individual accounts payable may consist of filed, unpaid invoices. Vouchers Payable will be supported by the individual vouchers, which are usually kept in a file, arranged in the order of maturity.

IX. Operating Revenues (Account No. 501)

Sales of Water

601 Metered Sales to General Customers
602 Flat Rate Sales to General Customers
603 Sales to Irrigation Customers
604 Private Fire Protection
605 Public Fire Protection
606 Other Sales to Public Authorities
607 Sales to Other Water Utilities
608 Interdepartmental Sales

Other Water Revenues

610 Rent from Water Property
611 Interdepartmental Rents
612 Customers' Forfeited Discounts and Penalties
614 Servicing of Customers' Installations
615 Miscellaneous Water Revenues
616 Merchandising, Jobbing, and Contract Work

X. Operating Expenses (Account No. 502)[2]

A. Source of Supply Expenses

701 Operation Supervision and Engineering
702 Operation Labor
703 Operation Supplies and Expenses
704 Maintenance Supervision and Engineering
B 705 Maintenance of Source of Supply Plant
A 705.1 Maintenance of Reservoirs
A 705.2 Maintenance of Lake, River, and Other Intakes
A 705.3 Maintenance of Wells and Springs
A 705.4 Maintenance of Galleries and Tunnels
A 705.5 Maintenance of Other Source Structures
706 Water Purchased for Resale
707 Other Water Source Expenses
708 Rents
709 Joint Expenses—Dr.
710 Joint Expenses—Cr.

[2] The letter "A" to the left of an account signifies that the account is applicable to Class A utilities; the letter "B," to Class B utilities. All other accounts are applicable to both Classes A and B utilities. For an explanation of the classification of utilities, see page 4.

B. Power and Pumping Expenses

	721	Operation Supervision and Engineering
B	722	Operation Labor
A	722.1	Power Production Labor
A	722.2	Pumping Labor
	723	Fuel for Power and Pumping
B	724	Supplies and Expenses
A	724.1	Power Supplies and Expenses
A	724.2	Pumping Supplies and Expenses
	725	Maintenance Supervision and Engineering
	726	Maintenance of Structures and Improvements
B	727	Maintenance of Power and Pumping Equipment
A	727.1	Maintenance of Power Production Equipment
A	727.2	Maintenance of Pumping Equipment
	728	Rents
	729	Power Purchased or Transferred—Dr.
	730	Power Transferred—Cr.
	731	Joint Expenses—Dr.
	732	Joint Expenses—Cr.

C. Purification Expenses

	741	Operation Supervision and Engineering
	742	Purification Labor
	743	Purification Supplies and Expenses
	744	Maintenance Supervision and Engineering
	745	Maintenance of Structures and Improvements
	746	Maintenance of Purification Equipment
	747	Rents
	748	Joint Expenses—Dr.
	749	Joint Expenses—Cr.

D. Transmission and Distribution Expenses

	751	Operation Supervision and Engineering
B	752	Departmental Office Expenses
A	752.1	Maps and Records
A	752.2	Other Departmental Office Expenses
	753	Operation of Transmission and Distribution Lines
B	754	Operation of Meters
A	754.1	Removing and Resetting Meters
A	754.2	Miscellaneous Meter Expenses
	755	Services on Customers' Premises
	756	Maintenance Supervision and Engineering
	757	Maintenance of Structures and Improvements
B	758	Maintenance of Mains
A	758.1	Maintenance of Transmission Mains
A	758.2	Maintenance of Distribution Mains
B	759	Maintenance of Other Distribution Plant
A	759.1	Maintenance of Services

A 759.2 Maintenance of Meters
A 759.3 Maintenance of Hydrants
A 759.4 Maintenance of Fire Mains
A 759.5 Maintenance of Other Fire Protection Plant
A 759.6 Maintenance of Fountains and Basins
760 Rents
761 Joint Expenses—Dr.
762 Joint Expenses—Cr.

E. Customers' Accounting and Collecting Expenses

780 Supervision
B 781 Customers' Contracts, Orders, Meter Reading, and Collecting
A 781.1 Customers' Contracts and Orders
A 781.2 Credit Investigations and Records
A 781.3 Meter Reading
A 781.4 Collecting
782 Customers' Billing and Accounting
783 Miscellaneous Expenses
784 Uncollectible Accounts
785 Rents

F. Sales Promotion Expenses

786 Sales Salaries and Expenses

G. Administrative and General Expenses

790 Salaries of General Officers and Executives
791 Other General Office Salaries
B 792 Expenses of General Officers and General Office Employees
A 792.1 Expenses of General Officers
A 792.2 Expenses of General Office Employees
793 General Office Supplies and Expenses
794 Management and Supervision Fees and Expenses
795 Special Services
796 Legal Services
797 Regulatory Commission Expenses
798 Insurance
799 Injuries and Damages
B 800 Employees' Welfare Expenses and Pensions
A 800.1 Employees' Welfare Expenses
A 800.2 Pensions
801 Miscellaneous General Expenses
B 802 Maintenance of General Property
A 802.1 Maintenance of Structures and Improvements
A 802.2 Maintenance of Office Furniture and Equipment
A 802.3 Maintenance of Communication Equipment
A 802.4 Maintenance of Miscellaneous Property
803 Rents
804 Commissions Paid under Agency Sales Contracts

805 Franchise Requirements
806 Duplicate Miscellaneous Charges—Cr.
807 Administrative and General Expenses Transferred—Cr.
808 Joint Expenses—Dr.
809 Joint Expenses—Cr.

XI. Analysis of Surplus Accounts

Credits

271 Earned Surplus (at beginning of period)
400 Credit Balance Transferred from Income Account
401 Miscellaneous Credits to Surplus
Total Credits

Debits

410 Debit Balance Transferred from Income Account
411 Dividend Appropriations—Preferred Stock
412 Dividend Appropriations—Common Stock
413 Miscellaneous Reservations of Surplus
414 Miscellaneous Debits to Surplus
Total Debits
271 Earned Surplus (at end of period)

Some of the subsidiary accounts may, in turn, control accounts subsidiary to them. For example, the account Distribution Mains and Accessories (322) would be supported by accounts showing details by size of main. In other words, any account which controls other accounts may be referred to as a controlling account, even though it is itself subsidiary to some other controlling account.

The Ledger

For the purposes of the present discussion a ledger may be defined as a group of accounts. Ledgers are frequently spoken of as books containing groups of accounts, but this is not always true: For example, a file of cards carrying customers' accounts may constitute a ledger. Two groups of accounts must be recognized in this connection, namely, principal accounts and subordinate accounts, the former making up the General Ledger, the latter the subsidiary ledgers. Each of these types of ledgers will be discussed separately.

The General Ledger

This ledger will contain the balance sheet and the income accounts listed on pages 24–28. Some utilities frequently in-

clude in the General Ledger several of the subsidiary accounts listed on pages 29–35. Inclusion of any of these accounts will depend on the size of the utility and the number of accounts involved.

Since the two principal statements are prepared from the General Ledger, it constitutes the heart of the accounting system. Each controlling account in this ledger must be reconciled frequently with the subsidiary accounts which it controls. Preferably it should be a loose-leaf book in which a separate page is provided for each account. A form for a General Ledger account is illustrated in Figure 1.

Subsidiary Ledgers

The number of subsidiary ledgers in use will depend on the number of groups of subsidiary accounts. Chart III illustrates some of the subsidiary ledgers frequently used by a medium-sized utility. It should be noted that the ledgers correspond with the principal controlling accounts listed on pages 24–28.

The nature of the accounts contained in a ledger is discussed in detail in each chapter dealing with the specific group of accounts. Reference to such chapters is made in the last column of the chart. Except for operating revenue, operating expense, and clearing accounts, forms for the accounts included in each of the above ledgers are illustrated in the chapters referred to. The forms for the subsidiary operating revenue and expense accounts are similar to that illustrated in Figure 1. The only difference is that the headings for these forms would show, in addition to the name and number of the subsidiary account itself, the name and number of the controlling account.

Arrangement of Accounts and Records

As indicated before, there is not necessarily any relationship between ledgers and books. So far as subsidiary accounts are concerned, any group of accounts controlled by a controlling account constitutes a ledger. One book may contain several ledgers; or one ledger may be divided among several books; or a ledger may not consist of a book at all but of a group of cards, or other forms, in a file or a binder. The number of books used will depend on the magnitude of accounts. Where several ledgers are carried in one book, they should be arranged in the

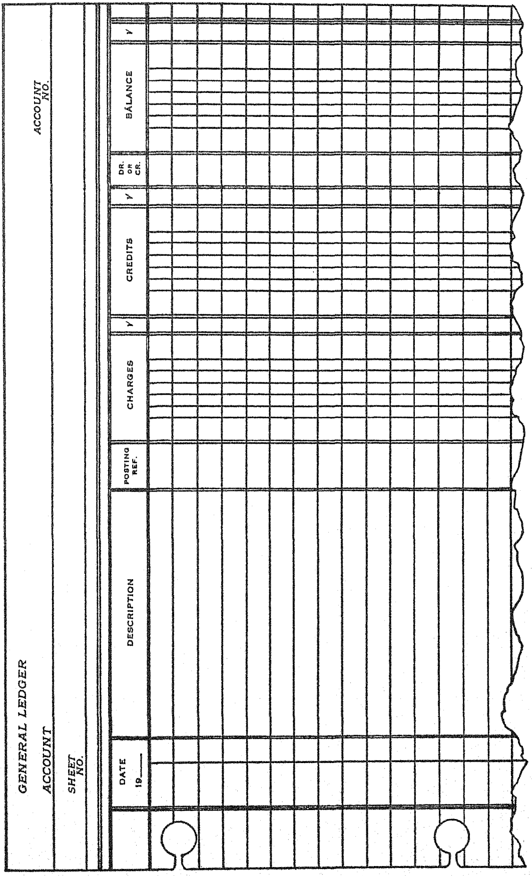
GENERAL LEDGER
ACCOUNT
SHEET NO.
ACCOUNT NO.
DATE 19__
DESCRIPTION
POSTING REF.
CHARGES
✓
CREDITS
✓
DR. OR CR.
BALANCE
✓

FIGURE 1

CHART III

GENERAL LEDGER CONTROLLING ACCOUNTS AND SUBSIDIARY LEDGERS WHICH THEY CONTROL

Order of Arrangement	General Ledger Controlling Account		Subsidiary Ledger		
	Number	Name	Name	Subordinate Accounts Included	See Chapter
I	100.1	Utility Plant in Service	Utility Plant in Service	Account Nos. 301 to 342	17
II	100.3	Construction Work in Progress	Construction Work in Progress	Individual Work Orders	13
III	125	Accounts Receivable	Customers' Ledger	District and route controlling accounts and the individual accounts	6
IV	131	Materials and Supplies	Stores Ledger	Perpetual Inventory Cards	8
V	143	Clearing Accounts	Clearing Accounts Ledger	Account Nos. 901–909	12
VI	144	Retirement Work in Progress	Retirement Work in Progress	Retirement Orders	17
VII	145	Other Work in Progress	Other Work in Progress	Work Orders	13
VIII	222	Accounts Payable or Vouchers Payable	Accounts Payable or Vouchers Payable	Individual Accounts or Vouchers	7
IX	501	Operating Revenues	Operating Revenues	Account Nos. 601 to 616	6
X	502	Operating Expenses	Operating Expenses	Account Nos. 701 to 809	8–13

order in which the controlling accounts appear in the balance sheet and income statement, unless the division of the work among employees makes another arrangement advisable.

Within each group, the accounts should be set up in the order in which numbered. Each account title should show at least the following information: (1) Account Number, (2)

Account Title, (3) Controlling Account Number, and (4) Controlling Account Title.

Those accounts illustrated on pages 27–28 which bear no number need not be set up. Controlling accounts bearing the same number as the subsidiary accounts need not be set up in most instances. For example, let us take Maintenance of Source of Supply Plant, bearing account no. 705: Each of the accounts subsidiary to it bears the same number, except that another number has been added following the decimal point, as 705.1, 705.2, etc. In that case only the subsidiary accounts need be set up.

Such accounts are shown here primarily because small utilities may not find it desirable to show so great detail as is called for by the subsidiary accounts. For example, a plant of Class B may, according to the recommendations of the National Association of Railroad and Utilities Commissioners, use account 705 alone. Utilities of Class A, on the other hand, are not required to set up account 705 but must use, instead, accounts 705.1 to 705.5.

CHAPTER 4

BOOKS OF ORIGINAL ENTRY AND ACCOUNTING DOCUMENTS

Introduction

This chapter is divided into three parts. The first part deals with books of original entry, the second is concerned with accounting documents, and the third consists of entries illustrating how accounts, books of original entry, and documents are utilized in the accounting process.

Books of Original Entry

Before a transaction can be recorded, the account or accounts affected, as well as the amount involved, must be determined. Furthermore, the greater the degree of summarization of data prior to their transfer to the accounts, the more economical will be the bookkeeping process. Accordingly, a good accounting system must provide for records in which the data may be analyzed and summarized before posting to the accounts. These books are known as journals, registers, or books of original entry, and the three terms will be used synonymously throughout the manual.

The number and kinds of books to be employed will depend on the number of transactions involved and the extent to which it is desirable to post the data to the accounts in summarized form. In general, wherever numerous entries are involved, special books, or special columns in a general book, are provided. The following are some of the books of original entry likely to be employed by a medium-sized water utility:

1. Operating Revenue Register
2. Voucher Register
3. Purchase Register
4. Cash Receipts Register
5. Check Register
6. General Journal

Operating Revenue Register

This register, as its name implies, is used in analyzing operating revenue data for posting to the proper accounts. Revenues other than those arising from operations for which receivables are set up on the utility's books would be recorded in the General Journal. A form for an Operating Revenue Register is illustrated in Figure 2. The data for this register are derived primarily from billing summaries after proof of billing is secured. For further details, see Chapter 6.

An examination of Figure 2 reveals that there are two classes of operating revenues: (1) revenues derived from the sale of water, and (2) other water revenues. In view of the fact that no separate summary account is set up for each class in the classification of accounts, columns have not been provided for showing (1) total sales of water, and (2) total other water revenues. The totals for each, however, can be arrived at readily. The classification of operating revenue accounts illustrated is that listed on page 32. A utility may desire to sub-classify further some of its accounts, especially those representing the sale of water. For this purpose the register can be readily expanded.

In order to conserve space, no columns have been provided for some of the accounts listed in the classification of accounts. Provision is made in the last column for recording those revenues derived from sources other than the sale of water, for which no special columns have been set up. These include accounts to which postings are made infrequently. Where necessary, this column could also be used for accounts representing revenue derived from the sale of water.

Provision is made on the register for recording the data by districts. Where a utility does not classify its revenues by districts, this column will not be needed. If certain water revenues, such as those derived from the sale of water to the operating city, to other cities, or to other water utilities, are not recorded by districts, separate entries must be made for those sales which are to be classified by districts and those which are not to be thus classified even if both are billed for on the same day.

The entries may be made daily or at less frequent intervals. All entries should be made during the month in which they

FIGURE 2

OPERATING REVENUE REGISTER

MONTH OF SEPTEMBER 19—

Date 19—		Name or Source	District No.	Accounts Receivable Debit	Operating Revenues Credit	Sales of Water: Metered Sales Credit	Sales of Water: Flat Rate Sales Credit	Sales of Water: Private Fire Protection Credit
				125	501	601	602	604
Sept.	2	Daily Billing Proof Sheet	41	10,650.00	10,650.00	9,500.00	500.00	500.00
	2	Water Utility—City of X	..	2,000.00	2,000.00	....	....	....
	4	Daily Billing Proof Sheet	42	11,775.00	11,775.00	10,000.00	600.00	1,000.00
	4	City of Y (Operating City)	..	2,000.00	2,000.00	....	....	....
	4	Special Charges Control	..	1,200.00	1,200.00	....	....	....
	30	Daily Billing Proof Sheet	56	9,425.00	9,425.00	8,000.00	500.00	600.00
				193,875.00	193,875.00	150,000.00	10,000.00	13,000.00
				(√)	(√)	(√)	(√)	(√)

Continued on next page.

FIGURE 2 (Continued)

OPERATING REVENUE REGISTER

MONTH OF SEPTEMBER 19—

Continued from preceding page.

SALES OF WATER (*Continued*)		OTHER WATER REVENUES				
Public Fire Protection *Credit*	Sales to Other Water Utilities *Credit*	Penalties *Credit*	Servicing Installations *Credit*	Other Accounts		
				Amount *Credit*	Account No.	Account Name
605	607	612	614			
....	....	100.00	50.00	....	...	....
....	2,000.00	....	......	....	...	....
....	....	100.00	75.00	....	...	....
2,000.00	....	....	......	....	...	....
....	....	....	......	1,200.00	616 √	Merchandising
....	....	75.00	50.00	200.00	610 √	Rent from Water Property
2,000.00	6,000.00	6,000.00	875.00	6,000.00		
(√)	(√)	(√)	(√)			

FIGURE 3

VOUCHER REGISTER

MONTH OF SEPTEMBER 19—

Date 19—		NAME	PAID		Voucher Number	Vouchers Payable *Credit*	Utility Plant in Service *Debit*	Construction Work in Progress *Debit*	Materials and Supplies *Debit*	Stores Expenses—Clearing *Debit*
			Date	Check No.		222	100.1	100.3	131	902
Sept.	2	Acme Paper Company	....	....	1201	695.00	....	....	695.00	......
	2	Payroll	9/2	8177-8	1202	5,000.00	500.00	500.00	....	50.00
	3	Best Insurance Company	....	....	1203	118.00	....	....	....	......
	30	First National Bank	9/30	Memo	1321	8.00	....	....	....	....
						26,930.00	2,000.00	1,500.00	2,780.00	200.00
						(√)	(√)	(√)	(√)	(√)

Continued on next page.

FIGURE 3 (Continued)

VOUCHER REGISTER

MONTH OF SEPTEMBER 19—

Continued from preceding page.

Transportation Expenses—Clearing *Debit*	Laboratory Expenses—Clearing *Debit*	Shop Expenses—Clearing *Debit*	Retirement Work in Progress *Debit*	Operating Expenses *Debit*	OTHER GENERAL LEDGER ACCOUNTS—*Debit*		
					Amount	L.F.	Account
904	906	908	144	502			
....	......	......	......	....	....	...	....
300.00	100.00	200.00	100.00	3,250.00	....	...	....
....	......	......	......	....	118.00	132 √	Prepayments
....	......	.....	......	8.00	....	.....	....
1,200.00	300.00	650.00	300.00	15,000.00	3,000.00		
(√)	(√)	(√)	(√)	(√)			

occur, and the register should not be closed until all entries applicable to the month are entered. Except for the figures in the last column, postings from this book should not be made until after all billings for the month have been entered. Entries in the last column may be posted any time prior to the close of the month.

At the end of the month, each column is totaled. The sum of each of the column totals to the right of the second money column must equal the total of that column. The book is then ruled off as shown in Figure 2. Each total is posted to the appropriate account, indicated by the account number at the head of the column. In order to make certain that each column total (except the total of the last column) has been posted, a check mark is placed at the bottom of the column as soon as the total in the column is posted. The total of the last column is not posted since the accounts therein are each posted individually.

Voucher Register

Utilities using a voucher system should keep a Voucher Register. The system is explained in detail in Chapter 7. Briefly, the voucher system provides for the use of written documents known as vouchers (see Figure 52) which serve as authority for the incurring of expenditures. Approval is usually indicated by the signature of a person duly authorized to act, and upon approval, each voucher is entered in the Voucher Register. A form for a Voucher Register is illustrated in Figure 3.

No voucher should be entered until approval to do so has been secured from the proper official. Indication should be made on the voucher of both the principal controlling account and subsidiary accounts, if any, affected, and the amount to be charged to each account. Provision is made in the illustrated register for all general ledger accounts. A separate column is provided for each account to which many postings would be made during the month. Entries affecting other general ledger accounts would be entered in the last three columns. Provision is also made on the form for recording information as to date of payment of the voucher and the check number. The data in this column make it possible to determine readily which vouchers are outstanding at a particular time.

At the end of the month, each of the columns is totaled. The sum of all column totals to the right of the "Vouchers Payable" column must equal the total of that column. The book is then ruled off as indicated in Figure 3. The total of each money column except the last is posted to the appropriate account, as indicated by the number at the head of the column. As postings are made, a check mark is placed immediately below the double line, as indicated in Figure 3. The total of the last money column is not posted since the individual amounts in that column are each posted to the appropriate account. These postings may be made at any time prior to the end of the month.

The Voucher Register illustrated provides only for postings to general ledger accounts; postings to subsidiary accounts may be made directly from vouchers. As previously indicated, provision is made on a voucher for recording both the general ledger and subsidiary accounts affected. Where many postings are made to a subsidiary account, it may be advisable to set up an auxiliary register to which such postings would first be made, the total, in turn, to be posted to the subsidiary account affected.

Purchase Register

As indicated subsequently, it is preferable that all utilities use the voucher system. The following alternative is, therefore, described for the benefit of those utilities which do not employ the voucher system for some particular reason, such as, for example, delays in payment of accounts payable and other conditions which make the use of the system impractical. Such utilities will find a Purchase Register useful.

A form for such a book is illustrated in Figure 4. The Purchase Register, as is evident from this illustration, is somewhat similar to a Voucher Register. Invoices form the basis for the entries to it. No invoice, however, should be entered in the register until approved by the proper official. Whereas the Voucher Register provides for the recording of practically all expenditures, the Purchase Register is limited to the recording of purchases and contractual services only. All other expenditures would be recorded in the General Journal unless paid for immediately in cash, in which case they would be entered in the Check Register.

At the end of the month, each of the money columns should

FIGURE 4

PURCHASE REGISTER

MONTH OF SEPTEMBER 19—

Date 19—		Name	Accounts Payable Credit	Utility Plant in Service Debit	Construction Work in Progress Debit	Materials and Supplies Debit	Transportation Expenses—Clearing Debit	Laboratory Expenses—Clearing Debit	Other General Ledger Accounts Debit		
			222	100.1	100.3	131	904	906	Amount	L. F.	Account
Sept.	2	Acme Paper Co.	695.00	......	......	695.00	......	......	......	....	....
	3	Dock Brick Co.	1,000.00	......	1,000.00	......	......	......	......	....	....
	4	Best Chemicals Co.	500.00	......	......	......	......	500.00	......	....	....
	5	Allis Machine Co.	1,000.00	1,000.00	......	......	......	......	......	....	....
	6	Machine Oil Co.	100.00	......	......	......	100.00	......	......	....	....
	6	Lewis Brothers	200.00	......	......	......	......	......	200.00	144 √	Retirement Work in Progress
	30	Durable Steel Co.	1,000.00	......	1,000.00	......	......	......	......	....	....
			17,800.00	4,500.00	9,000.00	1,800.00	300.00	1,500.00	700.00		
			(√)	(√)	(√)	(√)	(√)	(√)			

be totaled. The sum of the money column totals to the right of the "Accounts Payable" column must equal the total of that column. The page is then double-ruled, and the total of each column is posted to the appropriate account, as indicated by the number at the head of each column. As in the case of other registers, the last money column total is not posted because the amounts will already have been transferred to the individual accounts before the end of the month.

Where the Purchase Register is in use, a separate account is kept with each customer in an Accounts Payable Ledger. Postings to these individual accounts may be made either directly from the invoice or from the Purchase Register. Each of the other columns represents a general ledger controlling account. Postings to the subsidiary accounts would generally be from invoices.

Cash Receipts Register

All entries affecting receipts must be recorded in this register. This is true even of transactions involving the receipt of cash only in part, as, for example, the receipt by the utility of both cash and property in liquidation of a loan. A simple form of Cash Receipts Register is illustrated in Figure 5.

Since it is assumed that two separate cash accounts are maintained, two cash columns are provided in Figure 5, one for general cash and another for construction cash. Another assumption is that two banks are used, but that general and construction cash are each deposited in a separate bank. Otherwise the columns showing deposits in each bank would have to be further subdivided to show the amount applicable to each bank account. The last two columns would be omitted for any municipal utility whose funds are handled by the city treasurer and where no specific bank account is designated for the utility.

The entries to this record are based mainly on the cashier's daily report (see Figure 35) and reports of deposits submitted by banks. Although receipts are usually not deposited until the day after they are received, it is customary in practice to assume that they are deposited the same day and to make the entries in the bank columns as of the day on which received. At the end of the month, each column should be totaled. Since it is assumed that all cash receipts will be deposited intact in the

FIGURE 5

CASH RECEIPTS REGISTER

MONTH OF SEPTEMBER 19—

Date		Explanation	Cash		Accounts Receivable	Customers' Deposits	Other General Ledger Accounts			Deposits	
19—			General *Debit*	Construction *Debit*	*Credit*	*Credit*	*Credit*			Bank A	Bank B
			120	117.1	125	227	Amount	L. F.	Account		
Sept.	2	Cashier's Report	1,210.00	......	1,110.00	100.00	......	....	......	1,210.00	......
	3	Cashier's Report	890.00	......	890.00	......	......	....	......	890.00	......
	3	J. S. Green	......	100.00	......	......	100.00	265 √	Contributions	......	......
	3	Sound Trust Co.	......	20,176.00	......	......	20,000.00	210 √	Bonds	......	......
			......	......	......	......	176.00	240 √	Premium	......	20,276.00
	30	Cashier's Report	1,100.00	......	1,050.00	50.00	......	....	......	1,100.00	......
			50,568.00	40,279.00	45,633.00	1,000.00	44,214.00	....	......	50,568.00	40,279.00
			(√)	(√)	(√)	(√)					

bank, the total of the "Deposits" columns should equal the total of the "Cash" columns. Similarly, the totals of the "Accounts Receivable," "Customers' Deposits," and "General Ledger" columns should equal the total of the "Cash" columns. After the totals have been found and checked for correctness the book should be double-ruled, as indicated in Figure 5. The amounts shown in the "General Ledger" columns will have been posted during the month, and the totals of each of the money columns to the left of this column would be posted to the appropriate account as indicated at the head of each column.

Postings of cash collections to individual customers' accounts, as well as summaries of collections by districts, are made on the basis of stubs turned in by cashiers. The detailed procedure is discussed in Chapter 6. A file of customer deposit receipts may give the details as to customers' deposits, or a special register may be set up for this purpose, as illustrated in Figure 15.

Where the utility has numerous special fund accounts and only a few transactions affecting the accounts occur, the "General Ledger" columns of the Cash Receipts Register may be expanded to take care of the special cash fund accounts by adding a column thereto. The column headings would then appear as illustrated in Figure 6.

Check Register

The Check Register is used to record disbursements made by check. All disbursements except those made out of a petty cash fund should be by check. A form for a Check Register is illustrated in Figure 7.

It is assumed that a voucher system is in use and that each disbursement must be supported by a general journal entry or by a voucher: consequently, a column is provided for inserting the voucher number. It is also assumed that a separate Check Register is used for each bank account or that the utility has all of its funds in one bank. Where one register is made to cover several banks, a separate bank column would be set up under each of the two "Cash" columns illustrated in Figure 7.

Checks issued form the basis for entries to the Check Register. As entries are made daily in the register, proper indication should be made in the "Paid" column of the Voucher Register. The money columns should be totaled at the end of each

FIGURE 6

CASH RECEIPTS REGISTER (ALTERNATIVE FORM)

MONTH OF SEPTEMBER 19—

Date 19—		EXPLANATION	General Cash *Debit*	OTHER CASH ACCOUNTS—*Debit*			Accounts Receivable *Credit*	Customers' Deposits *Credit*
			120	Amount	L. F.	Account	125	227
Sept.	2	Cashier's Report	1,210.00	....	......	....	1,110.00	100.00
	3	Cashier's Report	890.00	....	......	....	890.00	....
	3	J. S. Green	....	100.00	117.1 √	Construction	....	....
	3	Sound Trust Company	....	20,176.00	117.1 √	Construction	....	....
	30	Cashier's Report	1,100.00	....	......	....	1,050.00	50.00
			50,568.00	40,279.00	......	....	45,633.00	1,000.00
			(√)				(√)	(√)

Continued on next page.

FIGURE 6 (Continued)

CASH RECEIPTS REGISTER (ALTERNATIVE FORM)

MONTH OF SEPTEMBER 19—

Other General Ledger Accounts—*Credit*			Bank Deposits	
Amount	L. F.	Account	Bank A	Bank B
....	.....	....	1,210.00	....
....	.....	....	890.00	....
100.00	265 √	Contributions	....	....
20,000.00	210 √	Bonds	....	....
176.00	240 √	Premium	....	20,276.00
....	......	....	1,100.00	....
44,214.00	......	....	50,568.00	40,279.00

Continued from preceding page.

FIGURE 7

CHECK REGISTER—BANK A

MONTH OF SEPTEMBER, 19—

Date 19—		Name	Check Number	Voucher Number	Vouchers Payable *Debit*	Cash: General *Credit*	Cash: Construction *Credit*
					222	120	117.1
Sept.	2	Illinois Coal Company	8176	1170	1,296.00	1,296.00	....
	2	Payroll	8177	1202	4,500.00	4,500.00	....
	2	Payroll	8178	1202	500.00	....	500.00
	30	First National Bank	Memo	1321	8.00	5.00	3.00
					52,731.00	37,513.00	15,218.00
					(√)	(√)	(√)

month, the book properly ruled, and the totals transferred to the respective accounts, as indicated by the account number at the head of each column. The total of the two "Cash" columns must equal the total of the "Vouchers Payable" column, further proof of accuracy of postings to the "Cash" columns being secured when the bank statement is found to be in agreement with the balances shown by the cash account or accounts after reconciliation.

General Journal

The General Journal is used to record transactions which are not entered in any other register. In its simplest form the book has two columns, one for debit postings and another for credit postings. When many subsidiary accounts are involved, two additional columns may be provided to facilitate posting to such accounts. A form for a General Journal is illustrated in Figure 8.

Proof of accuracy of the entries made in the "General Ledger" columns of the General Journal is assumed when at the end of the month the total of the debit columns is found to be equal to the total of the credit columns. Proof of accuracy of the amounts entered in "Subsidiary Ledger" columns is obtained both by adding the amounts supporting individual debits and credits in the "General Ledger" columns to see that they are in agreement therewith, and also by checking subsidiary accounts against their control accounts at the end of each month.

Posting may be made as soon as an entry is recorded or at periodic intervals. All posting should be completed by the end of each month before a trial balance of the General Ledger is taken and before the totals of subsidiary accounts are compared with their control account. Entries are posted individually to the accounts in both the General Ledger and subsidiary ledgers. As an amount is posted, a check mark is placed after the account number, as illustrated in Figure 8.

Journal Voucher

Some utilities prepare a separate Journal Voucher for each transaction or group of transactions, from which postings are made to both general ledger and subsidiary accounts. These

FIGURE 8

GENERAL JOURNAL

MONTH OF SEPTEMBER, 19—

Date 19—		Explanation	General Ledger			Subsidiary Ledger		
			L. F.	*Debit*	*Credit*	L. F.	*Debit*	*Credit*
Sept.	2	Dividends Receivable	128 √	600.00	....	.....	....	....
		Dividend Revenues	523 √	....	600.00	.....	....	....
		2% Dividend declared on 1200 shares of ABC Preferred Stock.	....	....	....	.....	....	....
	3	Subscriptions to Capital Stock	127 √	80,000.00	....	.....	....	....
		John Harding	....	....	....	127.16 √	20,000.00	....
		K. Harris	....	....	....	127.17 √	30,000.00	....
		B. Jones	....	....	....	127.18 √	20,000.00	....
		J. Sutton	....	....	....	127.19 √	10,000.00	....
		Capital Stock Subscribed	204 √	....	80,000.00	.....	....	....
		Subscriptions to Common Stock as above. No stock to be issued until entire subscription is fully paid.						

FIGURE 9

JOURNAL VOUCHER

NO. *2345*

Date *September 2, 19—*

Explanation of Entry

2% Dividend declared on 1200 shares of ABC Preferred Stock.

Account Name and Number	General Ledger		Subsidiary Ledger
Dividends Receivable (128)✓	600.00		
Dividend Revenues (523)✓		600.00	

Approved..

Entered:

General Ledger..............................

Subsidiary Ledger.........................

Journal Vouchers are dated and numbered consecutively, as issued, and are usually filed numerically in a binder, such vouchers then constituting the General Journal. A Journal Voucher usually provides for the authentication of each journal entry by a designated official. A form of Journal Voucher is illustrated in Figure 9.

Each Journal Voucher must be approved by the proper official before postings are made therefrom. Postings may be made daily or at less frequent intervals, but all vouchers must be posted before the end of the month. The advantage of the Journal Voucher is that each entry bears the approval of an authorized official; the disadvantage is the possibility of misplacing vouchers. If, however, vouchers are properly numbered and employees are forbidden to remove them from the binder once they have been numbered, the disadvantages can be readily overcome. In some instances the proper supporting documents are attached to each voucher, in which case vouchers are filed together with supporting documents.

Other Registers

In addition to the books of original entry, there are other registers which provide for the analysis of data before posting to the accounts. The difference between these registers and books of original entry is that the former are used merely for analysis purposes. Postings are not made from such books directly: instead, the results of the analysis, as shown by each register, are made the basis for an entry in the General Journal,[1] and postings are made to the accounts from that Journal. The following are a few examples of the registers illustrated in this manual:

Notes Receivable Register, Figure 44.
Materials Issued Register, Figure 59.
Payroll Register, Figure 68.
Insurance Register, Figure 69.
Register of Bond Investments, Figure 102.
Bond and Interest Record, Figure 108.

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[1] Wherever the term "General Journal" is used, reference is also to Journal Vouchers, since the Journal Vouchers taken together constitute a General Journal.

Accounting Documents

Each accounting transaction is usually evidenced by a written document, or documents, which forms the basis for the entries in the journals or registers. For example, entries made in the Voucher Register are supported by vouchers together with vendor's invoices, purchase orders, receiving reports, etc.; and entries in the Cash Receipts Register are supported by a cashier's daily report, cashier's stubs, deposit receipts, etc. It is from such underlying accounting documents that the essential information for entries in the books of original entry is obtained. Information in these accounting documents frequently determines the effective date of a transaction, and indicates the accounts to be posted. Names of documents illustrated in this manual will be found in the list of figures.

Since practically every document serves as supporting evidence for the entries made in the various records, a few general suggestions with reference to the design of forms are given here. Forms—particularly documents which are used together in connection with some transactions, as, for example, purchase orders and vouchers—should as far as practicable be not only of a uniform size, but also of a standard size so that they can be placed in standard binders, folders, or files. In order to avoid excessive paper costs the smallest practicable standard size should be used.

The quality of paper should be determined after taking into consideration the usage that will be made of the form and the length of time for which it is to be preserved. Obviously, if a form will receive rough treatment, a good grade of paper is needed. Similarly, if a form is to be kept for a period of more than one year, it will require a better grade of paper than one which is to be kept one year or less.

Space should be provided on the form for filling in all the necessary information. Nothing which can be printed should be left to be inserted by the person filling in the form. The items called for should be stated specifically so that there can be no misunderstanding as to what is wanted. All departments required to make use of the form shou'd be consulted; otherwise, information which some department needs may inadvertently be omitted. All filing symbols and references to controlling rec-

ords should be placed in a prominent position so that they can be readily noted.

By proper cooperation between various departments, several can use one form for certain purposes. While the cost per form decreases with an increase in the number printed, the possibility of changes in forms should be recognized; and since such changes are likely to result in an excessive number of old forms remaining on hand, old forms should be destroyed as soon as new ones are put into use. The use of old and new forms at the same time is likely to lead to confusion.

Through proper control of some accounting documents, a partial system of internal check can be secured: All receipts, checks, and other similar documents should each be assigned a series of numbers. A record should be kept of the numbers of the documents turned over to employees handling them, and at frequent intervals employees should be required to account for each document. Thus, an employee issuing customers' deposit receipts would have to account, either by cash or by unused and spoiled receipts, for all receipt documents turned over to him.

Summary

By way of summary, it might be well to trace the accounting procedure in the order in which it takes place. Every recorded transaction is evidenced by some document which forms the basis for entries. The process of determining in which books transactions are to be entered, which accounts are affected, and the amount to be posted, is known as journalizing. A transaction may be entered in some special register such as, for example, the Cash Receipts, Voucher, or Check Registers, or it may be recorded in the General Journal. Data are posted from the books of original entry to accounts. Financial statements, then, are no more than an orderly arrangement of accounts in such manner that significant financial facts can be readily deduced therefrom.

Journal Entries

Journal entries are used throughout this manual to illustrate accounting principles and procedures. Certain general facts concerning them should be noted, i.e.: Every entry is followed by

an explanation indicating the book in which the entry originates and the reasons for making the particular entry. Except for a few cases, the main part of each entry contains only controlling accounts, postings to subsidiary accounts being indicated in the explanatory part. Accordingly, where no subsidiary accounts are involved, no postings to subsidiary accounts are indicated. The numbers in parentheses after each account designate the account number in the classification of accounts listed in Chapter 3.

Opening the Books of a Utility

The following opening entries to record the acquisition of a utility will help in visualizing the accounting procedure followed in recording transactions. Since there are various methods of financing the construction or acquisition of a water utility and since the entries connected with securing funds for such purpose are given in Chapter 18, they will not be given here. Further, it will be assumed that an established utility is acquired and that no acquisition adjustments are involved. The entry to record this transaction is as follows:

Utility Plant in Service (100.1)	$150,000	
Construction Work in Progress (100.3)	10,000	
Sinking Fund (113)	30,000	
Notes Receivable (124)	15,000	
Accounts Receivable (125)	35,000	
Materials and Supplies (131)	4,000	
Prepayments (132)	1,000	
Bonds (210)		$ 75,000
Notes Payable (220)		2,000
Accounts Payable or Vouchers Payable (222)		5,000
Taxes Accrued (228)		1,000
Reserve for Depreciation of Utility Plant (250)		10,000
Reserve for Uncollectible Accounts (254)		750
Best Water Works Company, Vendor (231)		151,250

An entry in the General Journal to record the purchase of the assets of the Best Water Works Company and assumption of the liabilities owing by that company.

The above are all general ledger accounts. In addition, except possibly for the Vendor account (231), they are controlling

accounts and would each be supported by subsidiary accounts. Thus, a subsidiary ledger would be established for each group of subsidiary accounts. If the vendor company turns over to the purchaser the subsidiary ledgers, no postings should be made thereto until each ledger balance has been checked with the balance of the account by which it is controlled and the two found to be in agreement.

When the vendor is paid, the entry is as follows:

Best Water Works Company, Vendor (231)	$151,250	
Cash (120)..........................		$151,250

An entry in the Check Register to record payment of liability incurred in acquiring the net assets of the Best Water Works Company.

To summarize: Setting up an accounting system involves forming the accounting organization, selecting a classification of accounts, determining the books of original entry to be kept, and providing for the various documents to be used. Attention is called to the fact that, in establishing the system, care must be taken to estimate not only the present needs of the utility but also the likely expansion of the utility's business in the near future. Unless this is done, the system may quickly become antiquated.

Part II

CUSTOMER ACCOUNTING AND COLLECTING

CHAPTER 5

CUSTOMER ACCOUNTING PROCEDURE UP TO TIME OF BILLING

Introduction

Customer accounting forms an important phase of a utility's activities in that the utility's revenues are derived primarily from charges for services rendered to customers. Naturally, one of the first requisites to the proper performance of this function is accuracy, because unless the work is done accurately, the utility not only loses revenues to which it is properly entitled but also the good will of customers. Moreover, since customer accounting involves a group of interrelated functions, each of which must be properly timed to secure maximum efficiency, the second and third requisites are promptness and a smooth working procedure.

The functions of customer accounting involve:

1. Recording all essential information regarding each customer.
2. Determining at regular intervals the amount of water consumed by each customer as well as the extent of any other services rendered.
3. Billing each customer for water consumed or for other services rendered and keeping a proper record of the amount due from each.
4. Seeing that customers pay their bills.
5. Providing for the prompt recording of collections and for the proper crediting of each customer with the amount paid.
6. Supplying the management with such customer accounting data as may be required or desired.
7. Supplying the general accounting office with summaries which can be used as a basis for making the necessary entries in the general accounting records.

Customer accounting and collecting procedure will differ somewhat among water utilities, depending on:

1. The manner in which customers' accounts are kept; that is, whether the ledger plan, the stub plan, or the register plan of keeping a record of customers' accounts, is followed. Each of these plans is discussed in detail in Chapter 6.
2. Whether or not water charges are a lien against the property served. For example, where charges for water service constitute a lien, certain safeguards, such as requirement of a deposit by new customers, are sometimes dispensed with. (Many municipal utilities operate under a lien law, while private water works do not generally enjoy such privilege.)
3. The basis of billing customers; that is, whether customers are billed on the basis of actual consumption, as indicated by a meter, or on a flat rate basis.
4. The size of the utility.
5. Personal preferences and prejudices of the management.

Except for the last, these differences have been recognized throughout the present chapter and the chapter following; and the procedure common to water utilities under all circumstances is discussed, although departures are made to point out variations. This chapter is devoted to a discussion of the procedure up to the point where the customer is billed; the following chapter treats of customer accounting and collecting procedure from the time the customer is billed until the account is closed.

Planning the Work

The work plan of the customer accounting office of a municipally owned water department, 100 per cent metered, operating under the lien law and the ledger plan, has been chosen to illustrate the principles involved in planning the work of a customer accounting office. It is believed that the principles are the same for all utilities, although the plan outlined would have to be modified to fit particular situations.

The water utility described above uses a three step, sliding scale rate structure with a service charge based on meter size, and imposes a penalty for late payment. Its accounts are billed quarterly, and a two day cycle plan is used, thus allowing two days for the completion of each operation in each unit. For meter reading, billing, and control purposes, the city is divided into zones, districts, and meter reading routes, as illustrated by Figure 10.

FIGURE 10

DISTRICTING SCHEDULE

Central Zone Districts		Western Zone Districts		Eastern Zone Districts	
11	12	41	42	71	72
13	14	43	44	73	74
15	16	45	46	75	76
17	18	47	48	77	78
19	20	49	50	79	80
21	22	51	52	81	82

Meter Reading Routes in Each District				
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50

82

Note: Each meter reading route consists of approximately 175 accounts.

FIGURE 11

PERMANENT SCHEDULE OF OPERATIONS

District	Read Meters	Prepare Bills	Deliver Bills	Due Date	Post Penalty & Mail First Collection Notice	Mail Second Collection Notice	Collector's First Call	Collector's Second Call (One Month Later)
1	10	17	21	2	12	22	2	2
2	12	19	23	4	14	24	4	4
3	15	22	25	6	16	26	6	6
4	18	25	28	9	19	29	9	9
5	20	27	1	12	22	2	12	12
6	23	30	4	15	25	5	15	15
7	25	2	7	18	28	8	18	18
8	27	4	9	20	30	10	20	20
9	30	7	12	23	3	13	23	23
10	2	9	14	25	5	15	25	25
11	5	12	16	27	7	17	27	27
12	8	15	19	30	10	20	30	30

Zone	*Month Bill Is Payable*			
WESTERN	January	April	July	October
EASTERN	February	May	August	November
CENTRAL	March	June	September	December

To understand the permanent schedule illustrated in Figure 11, one must have in mind the districting plan illustrated above. The city is divided into three zones: central, western, and eastern. Each zone is, in turn, divided into twelve districts. The numbers indicating districts in Figure 11, are not the numbers of the districts but the relative position the district holds in the zone. For example, #1 indicates the first district in any of the zones, #2 the second district, etc. The other columns refer to the day of the month, the particular month depending upon the zone, district, and quarter one has in mind. The key to the month is the "Due Date." For example, take District 41: The diagram of the districting plan (Figure 10) indicates that District 41 is the first district in the western zone. To make the schedule applicable to this district, add (mentally) 40 to the district number, or place a "4" in front of the "1" in the District column. By referring to the lower part of Figure 11, it will be found that the western zone is payable January, April, July, and October. Assuming that one is interested in the quarterly cycle of District 41, whose due date is in January, the schedule would read as follows:

Read meters	December 10
Prepare bills	December 17
Deliver bills	December 21
Due date	January 2
Post penalty and mail first collection notice	January 12
Mail second collection notice	January 22
Collector's first call	February 2
Collector's last call	March 2

The schedule is also arranged so that one can determine when a particular operation is to be performed for each district. For example, if one is interested in the schedule for billing, he will refer to the column entitled "Prepare Bills" and read from top to bottom. In this manner, he will find that:

Billing for District 41 should start on December 17.
Billing for District 42 should start on December 19.
Billing for District 43 should start on December 22, etc.

A similar reading of other columns will reveal that approximately two days are allowed for each operation in each district. In actual practice, however, it is impossible because of Saturdays, Sundays, and holidays to adhere exactly to the scheduled

dates. Therefore an attempt should be made to be a day or two ahead of schedule in all operations, in order to allow not only for Sundays and holidays, but also for unexpected delays.

A few moments' study of the schedule will clearly indicate the theory and practice of the cycle plan. Reading from left to right, there is a demonstration of the district quarterly cycle, and reading from top to bottom, there is a demonstration of the individual operation cycle. A schedule of this design is a bit puzzling to anyone not familiar with it, but the employees of a customer accounting department soon become accustomed to it and read it with no difficulty. A few enlarged copies posted about the customer accounting office will do a great deal toward holding to schedule because each employee knows at all times just where he, or his group, stands in relation to the schedule.

The particular utility in which this plan is in operation has found it to be working out satisfactorily. Other utilities may find certain adjustments necessary. For example, a small utility will use fewer districts. Similarly, a utility which bills its customers monthly would need to make a corresponding adjustment in the schedule. On the whole, however, the principles illustrated can be applied to the planning of any water utility's customer accounting and collecting operations.

Opening New Accounts

Having indicated the general lines along which the customer accounting and collecting office should be organized and the work of the department planned, it is now possible to describe the operations of this office. One of the first steps in customer accounting is opening a customer's account. The prospective customer is usually required to file an application for service (Figure 12). Frequently, however, requests for service are made over the phone or by mail, in which case an employee fills out the application form, based on the information supplied by the applicant. The application is then checked against the files to determine the general credit rating of the applicant and to see if the applicant ever had service before and, if so, whether there are any unpaid bills outstanding. If the prospective customer's credit rating is satisfactory, usually no deposit will be required; if his credit is found to be unsatisfactory, he is usually required to put up a deposit. However, municipal utilities operating

under a lien law frequently require no deposit under any circumstances. Sometimes the guarantee of the account by a property owner will be accepted in lieu of a deposit (Figure 13). In most cases, however, the applicant must settle any unpaid bills, or make arrangements for the payment thereof, before water is turned on.

Where a deposit is required, the customer, upon paying the required sum, is given a receipt (Figure 14), which is made

FIGURE 12

APPLICATION FOR WATER SERVICE

Date..

Application is hereby made for the setting of a .... inch

meter for water service at the premises No. ....

on the .... side of .... St.

I hereby agree to pay for water service as the bills are rendered therefor in accordance with the rules and regulations of the XYZ WATER WORKS.

....

Applicant

out in duplicate, the carbon copy being used as the basis for an entry in the Deposit Register (Figure 15). Refund policies vary with different utilities. The procedure generally followed in making a refund is to have the customer endorse the deposit receipt. The back of the deposit slip carries a notation to the effect that endorsement shall constitute evidence of the return of the deposit to the customer. The deposit slip is then checked with the Deposit Register to see that the deposit has not already been refunded. At the same time, notation of the payment is made on the register, and the customer's deposit is refunded. Provision is also made for refunds in cases in which the cus-

FIGURE 13

GUARANTOR'S AGREEMENT

Date..

In consideration of your furnishing water service to

Name ....

Address ....

without requiring a cash deposit, I hereby guarantee the payment of all bills for such service from the date hereon until the account is closed or until 15 days after I shall have given written notice of my withdrawal as such guarantor.

....
Guarantor

....
Address of Guarantor

FIGURE 14

DEPOSIT RECEIPT

Date..

The XYZ WATER WORKS hereby acknowledges the receipt from

Name.. Address..

of .... Dollars, ($........................)
as a deposit as security for the payment of bills rendered after the date hereon.

The XYZ WATER WORKS agrees to pay interest on this deposit at the rate of five per cent per annum.

This deposit will be refunded by ....
with accrued interest on that date, provided customer has established satisfactory credit rating.

It is understood that this deposit may be applied to the payment of any delinquent bills, or bills due on discontinuance of service.

Deposit No. .... XYZ WATER WORKS

Account No. .... By ....

FIGURE 15

DEPOSIT REGISTER

YEAR ——

NAME	ADDRESS	DEPOSITS RECEIVED			ACCRUED INTEREST		REFUNDS	
		Date	Receipt No.	Amount	Date	Amount	Date	Amount
A. Jones	850 Superior St.	9/10	155	5.00	....	......	....	......
B. Cook	911 Cass St.	9/10	156	5.00	....	......	....	......

tomer has lost the deposit receipt, an affidavit to the effect of loss usually being required as a condition of payment.

In some utilities, a deposit card is used on which such essential information as the date the deposit was received, the customer's name, address, account number, and amount of deposits are recorded. Deposit cards are filed alphabetically unless a great number of cards is involved, in which case they may be filed by district, route, and account number. When a deposit is refunded, indication to that effect is made on the card, which is then filed, together with the endorsed deposit receipt, in a separate file. Frequently, no other records are kept than duplicate deposit receipts, which are withdrawn from the file as deposits are refunded.

As soon as the prospective customer's credit position is found satisfactory, or upon receipt of the proper deposit, an order to establish service is issued. The manner in which this order is executed will depend upon the status of the proposed connection. If the service connection is already established, the order would merely call for turning on the water (Figure 16).

The order should be made out in duplicate, the original going to the department or individual in charge of turning on the water, and the duplicate being filed for use as a follow-up. The execution of this order ordinarily includes reading the meter, turning on the water, and preparing a sketch showing the location of the meter, for the meter reader's sheet.

In the case of a new residence having no service connections, the procedure is somewhat different. The first step here is the filing of an application for the installation of a service connection (Figure 87). Service connections may be installed either by the customer's plumber or by the utility. However, even when the customer has a plumber make the connection, a permit from the water utility may be required. When the service connection is made by the utility, the customer is usually charged with the cost thereof, a cash deposit amounting to the average cost of the particular job sometimes being required. When the job is completed and the cost determined, a refund is made of the part of the deposit in excess of cost. Should the cost exceed the amount deposited, the customer is billed for such excess. The form used in compiling the cost of making service connections, as well as the procedure involved in com-

piling such cost, are discussed in Chapter 13. Here it is sufficient to point out that a customer's application for service is usually not considered until all connections have been made.

FIGURE 16

TURN ON ORDER

Date..

Address ....

Route and Account No. .... Meter No. ....

Name ....

Mailing Address ....

Reason New Application ....

Change of Name ....

DATA FOR BILL

Meter reading .... Date..

Turn on Fee $........................

Remarks: ....

....

....
Operator

Data entered on Meter Reader's Book...

Thereafter, the procedure is identical with that described for a customer who has service connections at the time of application for service.

As soon as an application is accepted and the water turned on, the location of the account in the meter book is determined,

and the account is given a number. A meter sheet is then prepared, containing all necessary information concerning the account, such as address, district, route, and account number. In larger utilities, an addressograph plate is prepared before setting up the meter sheet (Figure 17), which plate usually contains the following information: name and address of customer, district, route, and account number, and sometimes the meter number.

FIGURE 17

ADDRESSOGRAPH PLATE

John Doe	51–24–150	←	District 51
1042 Hudson Boulevard			Route 24
Blankville			Number 150

Where bills are to be mailed to an address other than that at which the property served is located, the mailing address may also be placed on the plate; and if a utility operates under a lien law, a code designating the legal description of the property may be included. The plates are used for imprinting meter readers' sheets, meter cards, customers' ledger cards or register sheets, and bills; they should be arranged by district and route number since the meter sheets, bills, stubs, and ledger cards are usually arranged in that order. An alphabetical cross-index is secured by running each plate off on a card and filing the cards alphabetically.

Meter Reading

Unless the utility charges customers on a flat rate basis, the quantity of water consumed is determined by a meter, readings being recorded by a meter reader on the meter sheet at regular intervals.

In some utilities, the duties of meter readers are limited to the reading of meters. In others, meter readers also test meters, investigate abnormal consumption, and distribute bills, their activity varying somewhat with the size of the utility.

The meter sheets are generally kept in loose-leaf books and grouped by route numbers. The sheets for each route are arranged in the order in which the meter reader will visit cus-

tomers' premises. Normally a sufficient number of meter sheets is included in a meter book to constitute a day's work for the meter reader. In some of the larger utilities, however, meter reading books are not taken into the field. Instead, slips bearing the address, as run off from the regular addressograph plates, are used, the reader simply dating each slip and recording thereon the meter reading.

Except where curb meters are used, it is often impossible to secure readings for all customers on the day scheduled. With respect to these "missed" readings, there is no common procedure. One procedure is for the meter reader to leave a self-addressed post card requesting the customer to read the meter, record readings on the card, and mail the card promptly. Other utilities require the meter reader to return to the location the same day or the next day. Still others have special "pick-up" men whose duty it is to secure missed readings. Whatever method is used, it should not be such as to disturb the routine of the scheduled work.

Where a reading cannot be secured before billing, an estimate of the amount consumed, based on the customer's past consumption, may be made. However, such estimates should not be made consecutively, and a proper notation must be made on the meter sheet, the bill, the ledger sheet, stub, or register sheet, that the amount consumed and billed for has been estimated. The necessary adjustment would then be made at the next reading of the meter.

The meter sheet usually provides space for recording meter readings and the quantity consumed, the latter sum being found by deducting the previous meter readings from the current reading. Some utilities require their meter readers to record only the readings registered by the meter. Others require, in addition, that the meter reader compute the quantity of water consumed. One of the reasons for such a requirement is that the meter reader can thus note any abnormal consumption and make preliminary tests himself, recording his finding on the meter sheet.

Meter readers should be required to turn in reading books at the end of the day or the following morning. Unread meter sheets are frequently removed and used for picking up missed readings. Many utilities, on the other hand, do not permit the

removal of meter sheets from the books, and in such cases, follow-up readings made during the next day cannot be recorded directly on the regular sheet, but must be reported on special pick-up slips, which are made out either by meter readers or by clerks who go through the meter books turned in and make out a separate slip for each unread meter. As soon as the pick-up slips are turned in to the office, the information is immediately transferred to the proper meter sheets.

Usually, meter books are reviewed before billing to insure that all computations are correct and to note excessive consumption. In some cases, bills, the amount of which cannot be derived from a pre-computed chart, are calculated at this time and entered on the meter reader's sheet.

Preparation of Bills

Billings from each book are ordinarily made a certain number of days after the meter is read, in accordance with a definite plan similar to that previously described. A sufficient period of time is thus allowed for securing missed readings and any other work that must be performed on the books in the interval between reading and billing. At the scheduled billing time, addressographed bills, arranged in the same order as the meter reader's sheets, are handed to the billing clerks. Bills may be printed in the accounting office or by the local printer, the latter usually furnishing them in medium-sized and small plants. The bills, as secured from the printer, lack only the addressograph and billing information.

The next step is the actual billing operation, the procedure for which is discussed fully in the following chapter.

CHAPTER 6

CUSTOMER BILLING AND BOOKKEEPING

THE preceding chapter dealt with customer accounting procedure up to the point of billing. This chapter takes up the procedure from that point. Since there are wide variations in customer billing and bookkeeping, depending on whether the ledger, stub, or register plan is used, the procedure followed under each plan is illustrated: First, the procedure commonly followed under the ledger plan is discussed, this description being followed by a discussion of the method of billing and bookkeeping under the stub and register plans, respectively; and since many parts of the procedure covered under the description of the first plan are applicable to the two other plans, the latter are discussed in less detail.

To help the reader in visualizing customer accounting procedure, Chart IV has been prepared showing the organization of a commercial division. The chart is self-explanatory, and the only comment believed necessary is to point out that the customer's service bureau performs such functions as accepting applications, giving information, and taking care of complaints.

BILLING AND BOOKKEEPING UNDER THE LEDGER PLAN

Billing Procedure

The billing and bookkeeping procedure described in this section is that followed by the municipal water utility whose customer accounting work-plan was treated in the preceding chapter. The essential details needed as a background to the study of this utility's procedure were given in that chapter, the reason for choosing a particular utility being to simplify the discussion and present a complete description of the operations of a customer accounting office. The principal forms used by that utility in connection with billing are as follows:

1. A meter reader's sheet (Figure 18)
2. A bill, with cashier's coupon attached (Figure 19)
3. A proof sheet (Figure 20)
4. A ledger card (Figures 21 and 22)

CHART IV

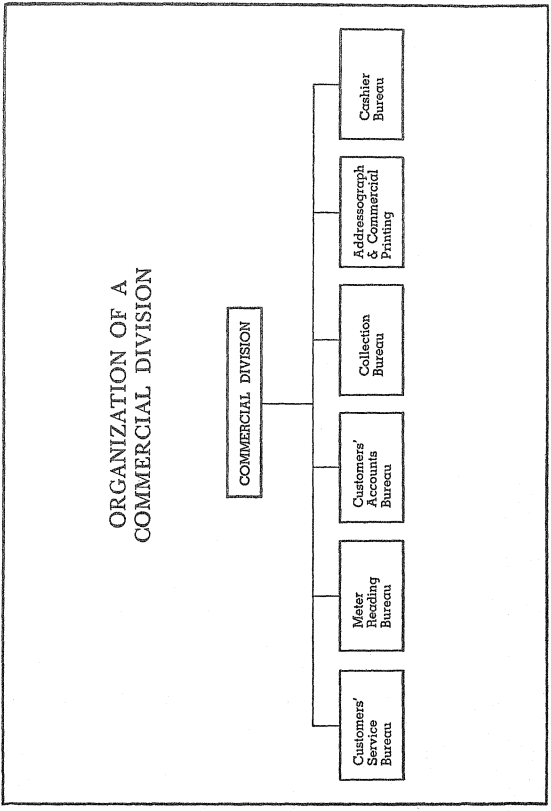
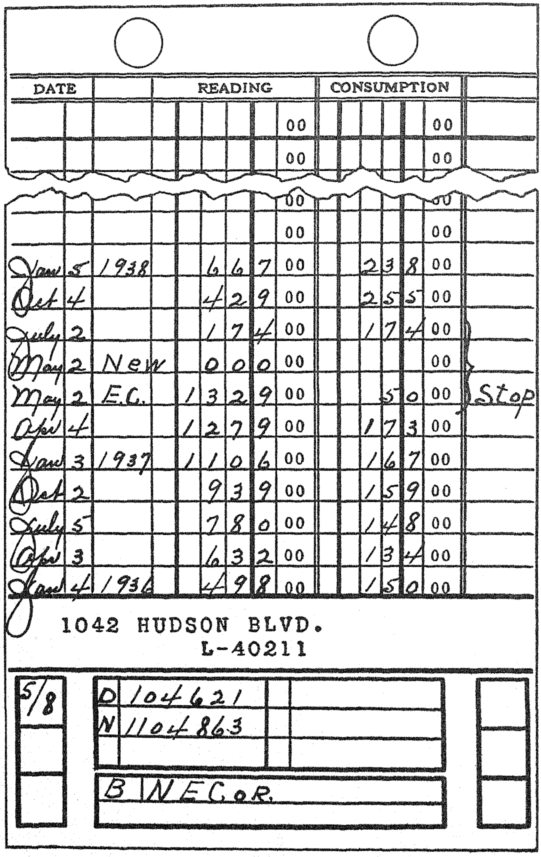

ORGANIZATION OF A COMMERCIAL DIVISION
COMMERCIAL DIVISION
Customers' Service Bureau
Meter Reading Bureau
Customers' Accounts Bureau
Collection Bureau
Addressograph & Commercial Printing
Cashier Bureau

FIGURE 18. METER READER'S SHEET



DATE			READING	CONSUMPTION	
			00	00	
			00	00	
			00	00	
			00	00	
Jan	5	1938	667 00	238 00	
Oct	4		429 00	255 00	
July	2		174 00	174 00	
May	2	New	000 00	00	
May	2	E.C.	1329 00	50 00	Stop
Apr	4		1279 00	173 00	
Jan	3	1937	1106 00	167 00	
Oct	2		939 00	159 00	
July	5		780 00	148 00	
Apr	3		632 00	134 00	
Jan	4	1936	498 00	150 00	

1042 HUDSON BLVD.
L-40211

5/8

D 104621
N 1104863

B NECoR.

FIGURE 19

BILL WITH CASHIER'S COUPON ATTACHED

THE BOARD OF
WATER COMMISSIONERS

BILL FOR WATER AT

1042 HUDSON BLVD.
L-40211

5% WILL BE ADDED AFTER	LEDGER
JAN.27,1938	51-24

METER READINGS DATE	PRESENT	DATE	PREVIOUS	Size of Meter	Consumption in Hundred Cubic Ft.	CHARGES
JAN 5	667	OCT 4	429	⅝ •	238	16.07

PERCENT	
TOTAL	

Failure to Receive Bill Does Not Waive Past Due Penalty

OFFICE HOURS
8:30 A. M. to 4:30 P. M.
SATURDAYS—FOR PAYMENT OF BILLS ONLY—8:30 A. M. TO 1:00 P. M.

CODE
MB—MINIMUM BILL AR—ARREARS
MR—METER REPAIR FL—FIRE LINE
MO—MONTH CR—CREDIT
EC—ESTIMATE C'S'N S—SURCHARGE
CS—SEE OVER BT—BLDG. TAX
TOT—TOTAL AMOUNT OF BILL

← WHEN REMITTING BY MAIL DETACH HERE →
STUB MUST ACCOMPANY ALL REMITTANCES

BOARD OF WATER COMMISSIONERS

1042 HUDSON BLVD.
L-40211

ADD 5% AFTER	LEDGER
JAN.27,1938	51-24

CHARGES	
•	16.07
PERCENT	
TOTAL	

FIGURE 20

ABSTRACT SHEET OR PROOF SHEET

PART I

OPERATOR C. G. LED. NO. 51-24 AD. 1ST A/C 24-28 Woodward SHEET NO. 1

PRESENT READING		PREVIOUS READING		SIZE	CONSUMPTION	AMOUNT DUE	
						*	
OCT 4		JUN 4		CS		2.25	
JAN 5	28	OCT 4		5/8 *	28	2.42	
						4.67 TOT	
JAN 5	18627	OCT 4	14868	2 *	3759	190.86	
JAN 5	10606	OCT 6	10278	1½ *	328	24.50	
JAN 5	772	OCT 4	413	1 *	359	24.25	
						• 238	16.07 ¢
						* 265361,651.92 ¢	
						Δ	¢
						AR	231.61 ¢
						CR	¢
						S	13.36 ¢
						267741,912.96 ¢	

•	1
*	73
▲	0

PART II

CONSUMPTION			CHARGE		SERVICE		CHARGE		LEDGER	CONTROL		
CONSUMPTION IN THOUSAND CUBIC FEET			AMOUNT		28 1/3	5/8"	17	00	RATES	1667	99	
1080	5	@ 65¢	702	33	13	3/4"	11	70	ARREARS	231	61	
1521	0	@ 50¢	760	50	11 2/3	1"	21	00	METER REPAIR	13	36	
75	9	@ 40¢	30	36	5	1½"	18	00	BUILDING TAX			
					10	2"	60	00	C. S.			
					4	3"	33	60				
					1	4 FL	3	50				
					1	6 FL	6	00				
6	0	MIN.	3	90								
FRACTIONAL CENT GAINS	10	− 1/2		05					TOTAL			
Gain	2	2 1/2		05					CREDITS			
		TOTAL	1497	19	TOTAL S. C.		170	80	TOTAL	1912	96	E. M.
					TOTAL C. C.		1497	19				
					TOTAL RATES		1667	99				

• indicates domestic consumption
* indicates commercial consumption
▲ indicates industrial consumption
AR indicates arrears
CR indicates credit

S indicates miscellaneous items, including meter repair, building tax, and CS (Construction service charge)
MB minimum bill

FIGURE 21

LEDGER CARD

1042 HUDSON BLVD.
L-40211

51-24

LOT 10 | R | A | S

CONSUMPTION	AMOUNT DUE BAL. FOR'D.	SUNDRY CHARGES AND CREDITS*	METER READINGS
134	9.31	'36 APR 17 9.31*	APR 3 '36 632
148	10.22	'36 JUL 20 10.22*	JUL 5 '36 780
159	10.94	'36 OCT 25 10.94*	OCT 2 '36 939
167	11.46	'37 JAN 27 11.46*	JAN 3 '37 1106
173	11.85	'37 APR 26 11.85*	APR 4 '37 1279
50 174 MR	15.16 2.00 17.16 TOT	'37 JUL 27 17.16*	MAY 2 EC 1329 JUL 2 '37 174
255	17.18	'37 OCT 26 17.18*	OCT 4 '37 429
238	16.07		JAN 5 '38 667

SIZE	KIND	NUMBER	IN	OUT	REMARKS
5/8	W. D.	104621	4-1-26	5-2-37	Stop H. W.
5/8	Nash	1104763	5-2-37		

FIGURE 22

LEDGER CARD

1042 HUDSON BLVD.
L-40211

51-24

LOT 10	R	X	S

CONSUMPTION	AMOUNT DUE BAL. FOR'D. 10.00	SUNDRY CHARGES AND CREDITS*	METER READINGS
• 134	9.31 19.31 TOT	'36 APR 17 20.31*	APR 3 '36 632
• 148 CR	10.22 1.00 9.22 TOT	'36 JUL 20 9.22*	JUL 5 '36 780
• 159	10.94	.55	OCT 2 '36 939
• 167	11.46 22.95 TOT	.57 '37 FEB 2 15.00*	JAN 3'37 1106
• 173	11.85 20.37 TOT	'37 APR 21 20.37*	APR 4'37 1279
• 50 • 174 MR	15.16 2.00 17.16 TOT	'37 JUL 24 17.16*	MAY 2 EC 1329 JUL 2 '37 174
• 255	17.18 34.36 TOT	'37 OCT 20 17.18* '37 OCT 21 17.18* 10-25-37 Ref.17.18	OCT 4 '37 429
• 238	16.07		JAN 5 '38 667

SIZE	KIND	NUMBER	IN	OUT	REMARKS
5/8	W.D	104621	4-1-26	5-2-37	Stop H. W.
5/8	Nash	1104763	5-2-37		

NOTE: The above ledger card is similar to that illustrated in Figure 21 except that a few unusual transactions have been included in order to illustrate how effectively they could be handled under the ledger plan. In the case of both

The billing machine used here automatically prints the bill, and the cashier's coupon, and posts the entry to the ledger card, at the same time making a carbon impression on the proof sheet of all data printed on the bill. The fact that all items posted to the bill, cashier's coupon, ledger card, and proof sheet, are accomplished by a single keyboard set-up is proof that all the items thus posted are identical.

Billing Proof and Revenue Analysis

Four points are considered in proving the correctness of billings. These include proving that:

1. Consumption has been correctly computed.
2. Rates have been correctly applied.
3. Unpaid balances have been correctly carried forward.
4. All miscellaneous charges have been correctly billed.

1. *Proof of consumption computation.* This proof is obtained directly from the billing machine, which is so constructed that it will lock if the consumption set up on the key board does not represent the true difference between present and previous meter readings. The error must, therefore, be corrected before the machine will operate.

2. *Proof of rate application.* This proof is obtained by the block method—that is, by applying the rate to the combined consumption of all items included on the proof sheet and then checking the result thus obtained with the total of the individual bills covered by the proof sheet. The exact procedure is de-

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cards symbols carry the following meanings: 51–24 = Western Zone, District 51, Route 24; R = Residence; A = Apartment; S = Store; H.W. = Hot Water. Meter readings are shown in hundreds of cubic feet. References will be throughout to the two middle columns entitled, respectively, "Amount Due" and "Sundry Charges and Credits." Each space in the body of the card marked off by a horizontal line will be referred to as an accounting space.

The first special feature of this card is the carrying over of a balance ($10.00) and the overpayment of a bill by $1.00 as indicated in the first accounting space. The manner in which this overpayment is handled is shown in the second accounting space. The third accounting space shows the posting of a penalty of 5% of the unpaid amount as does the fourth accounting space. It should be noted that in the latter case the penalty is not based on the total amount in arrears but only on the latest delinquent bill. The only special feature about the fifth accounting space is the carrying over of the arrears item of $11.85 from the previous accounting period. The special feature of the next accounting space is a meter repair bill of $2.00. The seventh space shows the manner in which a duplicate payment is handled.

pendent upon the consumption rates and service charges used, the water utility under consideration, as previously indicated, employing a three step consumption rate structure with addi-

FIGURE 23

SCHEDULE OF CONSUMPTION AND SERVICE CHARGES

Consumption Charges

From 0 to 10,000 cu. ft. per month................@ 65¢ per M
From 10,000 to 100,000 cu. ft. per month..........@ 50¢ per M
All above 100,000 cu. ft. per month................@ 40¢ per M

Monthly Service Charge

⅝″ Meter	$ .20	4″ Meter	$ 3.60
¾″ "	.30	6″ "	6.00
1″ "	.60	8″ "	9.20
1½″ "	1.20	10″ "	13.20
2″ "	2.00	12″ "	15.60
3″ "	2.80	16″ "	25.20
		24″ "	44.40

Service Charge is added to Consumption Charge and shown on the bill as one item.

Minimum Bill......$1.25 per quarter

Note: The consumption charge rates and the service charges shown above are on a monthly basis. To get the number of cubic feet applicable to each step for a three-month period, the number of cubic feet shown for the step must be multiplied by three. Thus, the first step, converted to a three months' basis, would read "From 0 to 30,000 cubic feet @ 65¢ per M". Similarly, the monthly service charges shown in the above chart must be multiplied by 3 in order to arrive at the service charge for a three-month period. The service charge for a three-month period on a ⅝″ meter would, then, be $.60 ($.20 × 3).

tional service charges based on the size of the meter, as illustrated in Figure 23.

In order to apply the block proof, it is necessary to determine how much consumption falls in the first step, how much in the second, and how much in the third. Since service charges are based on meter size, it is also necessary to determine the total number of months, or, as is illustrated by the balanced proof

sheet (Figure 20), the total number of quarters for each meter size carried on the sheet.

Minimum bills must also be taken into account. The utility under consideration provides for a minimum charge of \$1.25 per quarter. This charge allows for a consumption of 1,000 cubic feet on a 5/8″ meter and 500 cubic feet on a 3/4″ meter, as illustrated below.

5/8″ Meter		*3/4″ Meter*	
1000 Cu. ft. @ \$.65 per M	\$ .65	500 cu. ft. @ \$.65 per M	\$ .325
Three month service charge on 5/8″ meter	.60	Three month service charge on 3/4″ meter	.90
		Differential	.025
Total	\$1.25	Total	\$1.25

Since the service charge on meters larger than 3/4″ exceeds the minimum charge, there is no consumption allowance involved. The following example illustrates the problem of handling minimum bills where the amount consumed is less than the minimum allowed. Assume a 5/8″ meter account for which the consumption for three months is 300 cubic feet. This account will be billed for \$1.25 although the amount consumed is 700 cubic feet less than the 1000 cubic feet for which the customer is charged \$1.25. In breaking down the proof sheet, the 300 foot consumption will be picked up and included with consumption at the first step. But in order to balance the proof sheet, the remaining 700 cubic feet must be accounted for. These 700 cubic feet, together with any other unconsumed water billed for, are picked off the proof sheet and entered in total in the space designated "Min" (minimum) in the tabulation at the foot of Part II of the proof sheet (Figure 20). After the entire consumption billed on the proof sheet has been distributed to the various steps of the rate, the indicated rate of each step is applied and the results entered in the "Amount" column.

Certain combinations of consumptions and rates give rise to fractional cent gains. For example, if a rate applied to a given consumption results in a charge of \$1.375, the customer is billed for \$1.38. A 3/4″ minimum bill produces a 2½¢ differential. These differentials are counted and listed in the proof sheet tabulation in the space designated "fractional cent gains."

A clearer understanding of the block proof method will be

obtained if reference is made to the proof sheet illustrated in Figure 20. This sheet, it will be noted, is divided into two parts, Part I consisting of the individual billings as well as a summary thereof, and Part II consisting of the information grouped by blocks to prove the accuracy of the individual billings listed in Part I.

Three sets of columns are provided in Part II. The first set is headed "Consumption Charge," the second "Service Charge," and the third "Ledger Control." In the first are calculated the total consumption charges, the figures for this column being obtained from the "Consumption" column in Part I of the proof sheet. (See column headings at top of proof sheet.) A calculating machine operator goes through the latter column and determines the consumption for each bill falling into each of the three steps, namely, 65 cents per thousand cubic feet, 50 cents per thousand and 40 cents per thousand. For example, the second item in the "Consumption" column—i.e., 3759, representing 375,900 cubic feet—would be distributed as follows:

30,000 cubic feet applicable to the first step at 65¢ per thousand = $19.50
270,000 cubic feet applicable to the second step at 50¢ per thousand = $135.00
75,900 cubic feet applicable to the third step at 40¢ per thousand = $30.36

The amounts shown under "Min" (minimum) are determined from an examination of the "Consumption" and "Amount Due" columns of the proof sheet. A record is kept of gains of fractional cents, and these are included in the appropriate space, as illustrated. The consumption charges are then computed and the total carried down to the last line on the proof sheet.

The next step is to determine the total service charges. Part I of the proof sheet carries a column entitled "Size." Since service charges are based on the size of the meter, the operator goes through this column and tabulates the meters by groups according to size. Each group is listed separately, and the number of meters in each is multiplied by the rate applicable to the size of meter included in the group. For example, in the proof sheet used as an illustration, there are thirteen ¾" meters. The service charge for such meter is 30 cents per month, or 90 cents for three months. Multiplying 90 by 13, we get $11.70 as the total

service charges for this group of meters—and if we refer to the second item in the "Service Charge" column, we find that the total service charge shown for that group is $11.70.

The total service charges are then added and brought down, after which the total consumption charges are carried over from the bottom of the left-hand column and added in, giving the total amount derived from consumption and service charge rates ($1,667.99).

This total must agree with the amount shown as derived from rates in the third column at the foot of the proof sheet (that is, the column entitled "Ledger Control"). The figures shown here are obtained from the "Amount Due" column of the proof sheet (Part I) and represent amounts actually billed. If these totals do not agree, the computation of the bills listed on the proof sheet is checked to locate the error, after which the error is corrected and the proof sheet balanced.

This method of proving billing may seem to be a complicated and laborious process. It need not be, and will not be, if sufficient time and thought is given to planning the operation. The time required for the operation is, of course, dependent upon the rate structure; but it should not exceed 50 per cent of the time required for the billing operation, and in some cases will run much lower. Furthermore, as is partly evident from the proof sheet (Figure 20), the operation not only provides a positive proof of rate application but also a complete analysis of revenue. The following are some of the statistical data which are derivable from the proof sheet:

a. The total number of cubic feet consumed for each step in the rate schedule, as well as the total charges for each step
b. The total number of cubic feet covered by minimum bills, as well as total charges for all minimum bills
c. The number of each size of meter in use and the total service charges for each size of meter
d. The amount of current revenue derived from the sale of water

Current revenues are subdivided at the bottom of Part I so as to show the amount derived from domestic, commercial, and industrial sales, as well as the amount of cubic feet consumed in

each class. The number of customers included in each class is also given. (See bottom of Part I, left-hand side.) Figure 24 illustrates part of a yearly statistical summary compiled from these proof sheets.

3. *Proof that unpaid balances have been correctly carried forward on the ledger card and shown as arrears on the current bill.* The next item in the "Ledger Control" column at the

FIGURE 24

Reproduction of Part of Statistical Summary Based on Proof Sheets

WATER RATE ANALYSIS July 1, 1936	TO	STANDARD RATE June 30, 1937
Cubic Feet @ 65¢ per Thousand.......	3,974,476,400	$2,583,409.66
" " @ 50¢ per Thousand.......	973,020,400	486,510.20
" " @ 40¢ per Thousand.......	194,223,400	77,689.36
Min. " " @ 65¢ per Thousand.......	46,609,500	30,296.18
5/8 Inch Quarterly Service Charges........	773,484	464,090.40
3/4 " " " "	228,777	205,899.30
1 " " " "	34,971-1/3	62,948.40
1-1/2 " " " "	11,700-2/3	42,122.40
2 " " " "	8,385	50,310.00
3 " " " "	3,165-1/3	26,588.80
4 " " " "	13	140.40
6 " " " "	16	288.00
8 " " " "	1	27.60
1-1/2 " Fire Line " "	5	6.00
2 " " " " "	91	182.00
3 " " " " "	44	121.00
4 " " " " "	177-1/3	620.67
6 " " " " "	727-2/3	4,366.00
8 " " " " "	323	2,907.00
1/2¢ Gains...........................	484,813	2,424.07
Rate Differential......................	Debit	.09
TOTAL SALES..................		$4,040,947.53

foot of the proof sheet is "Arrears" ($231.61). These are recorded and proved in the following manner: The billing machine operator determines the amount of arrears on each account, if any, and sets up such amount on the machine keyboard. This operation results in the arrears item being printed on the bill and on the cashier's coupon, and the carbon impression being carried to the proof sheet. (See amounts following letter AR on proof sheet.) The arrears item is not printed

separately on the ledger card but is included in the total unpaid balance, which consists of arrears plus current charges, the machine being specially designed to provide this feature in order to conserve space on the ledger card.

The important point, as far as the proof of arrears is concerned, is the fact that all unpaid balances, as picked up by the billing machine operator, are listed on the proof sheet. Therefore, the sum of the arrears items so listed in each controlling unit represents the total arrears billed. This total is checked with the balance carried in the corresponding controlling account. Agreement of the figures is proof that all unpaid balances have been correctly carried forward on the ledger card and billed as arrears on current bills. If the figures do not agree, the error must be located and corrected.

4. *Proof of billing of miscellaneous charges.* The last items in the "Ledger Control" column on the proof sheet are miscellaneous charges such as meter repairs, building taxes (that is, charges for water used between the time the service was connected and installation of meter), and construction service charges (designated as C. S.). These are recorded and proved as follows: The charges are entered by control unit totals to a memorandum journal as they are received, thus providing a predetermined total of each class of miscellaneous charges for each controlling unit. When these charges are billed, they are symbolized and, by carbon impression, carried to the proof sheet. The proof sheet totals thus represent the miscellaneous charges billed, and are checked with the predetermined totals for proof of accuracy.

Cash Posting

It is always desirable, and usually considered advisable, to post payments to the ledger cards not later than the day following their receipt. Cash posting is an extremely simple operation under the ledger plan in that the date and amount of payment is simply posted to the ledger card. Partial payments are, therefore, handled as easily as full payments. It is important to remember that the machines are devised so that billings, payments, and unpaid balances are recorded in the same relative position across the card during any particular quarter. The position on the card showing billings, payments, etc., for a current period

will be referred to hereafter as the current accounting space. The operations are as follows:

1. Receipted coupons are sorted in ledger order.
2. The coupons are then listed on an adding machine, a transfer total being taken at the end of each controlling unit (that is, a route) and a grand total at the end of each district. The sum of the district totals should check with the total receipts reported by the cashier. If it does not, the error must be located and corrected.
3. Payments are posted to the ledger cards from the receipted coupons with a posting machine equipped with a red ribbon, a transfer total being taken at the end of each controlling unit (meter route) and a grand total at the end of each district. Before taking the grand total, a control card (Figure 25) is placed in the machine, so that the total may be printed thereon. The control card is sent to the control keeper for entry to the district controls. The machine provides a tape carrying a carbon impression of all items posted to the ledger cards, and the total of each controlling unit is printed on this tape. As the posting for each controlling unit is completed, the posting machine total is checked with the predetermined total (arrived at in step 2 above), and if the two are not in agreement, the error is immediately located and corrected. In this manner each controlling unit is balanced with the predetermined unit totals as the work progresses, and there is never any question as to whether or not the total amount posted to the ledger cards will agree with that reported by the cashier.

Penalty Posting

Theoretically the penalty posting operation is simply a matter of checking each account in the district whose due date has been passed and posting the penalty charge (in this case 5 per cent of the current bill) to all ledger cards where the current bill has not been paid. A cash posting machine, equipped with a black ribbon, is used for this operation, the penalty charges being posted in the upper right-hand corner of the current accounting space. This entry is not dated for the reason that all penalty items of a given district are posted on the same day, the

FIGURE 25

CONTROL CARD

Led. No. 45

'38 JAN 3 4,775.50*

CASH

Date Jan 3/1938

By A.R.R.

Checked

total penalty charges for the district being posted to the corresponding district controlling account (Figure 27), on which is indicated the date of posting.

Penalty charges are otherwise posted in the same manner as cash. A transfer total is taken at the end of each controlling unit and a grand total at the end of each district, the grand total being printed on a control card which is forwarded to the control keeper for entry in the controlling records. Postings to the individual accounts, as well as the unit and district totals, are printed on a tape by means of carbon paper.

The penalty posting operation would stop here if it were not for the fact that water bills may be paid to banks or other authorized agents of the water company. Consequently, the utility does not know which accounts have remained unpaid after the due date until agents have sent in collections. The penalty posting operation must, therefore, be delayed until all agent returns have been made. Ordinarily the agents are allowed a period of from two to five days after the due date in which to make their returns, and during this period the company cashier will be accepting late payments from customers and charging penalty for late payment. During this period, payments by mail will also be received by the cashier. Some of these late payments will include penalty, and some will not. It should be borne in mind that the day the utility receives the cash is not always the determining factor as to whether or not penalty should be charged. For example, a bill is considered paid on the date it is received by an authorized agent, regardless of when such payment is forwarded to the principal. Likewise, in cases of remittance by mail, the bill is considered paid on the date the letter is post marked, regardless of when delivered to the utility.

Because of the various circumstances referred to above, the penalty-posting clerk cannot tell from the date of payment, as posted to the ledger card, whether or not to post a penalty to a particular account. (The date of payment to be indicated on the ledger card is the date the cash was received by the utility and not the date received by agents.) Fortunately, however, the cashier or his assistants know whether or not penalty should be charged and therefore symbolize each cashier's coupon where payment was made after due date. This symbol is then transferred to the ledger card by the clerk who posts cash. The pen-

alty posting operation thereby becomes the simple operation of posting penalty to the accounts that have not been paid and to the accounts that have been paid but carry the symbol indicating that penalty should be charged.

Overpayments and Partial Payments

As previously indicated, the cash posting operation consists merely of posting the amount of the payment to the ledger card in the current accounting space. The cash entries thus posted will result in the account having either a smaller debit balance, a credit balance, or no balance, depending respectively on whether only part of the amount due is received, a greater sum than that due is received, or the exact amount due is received. If a debit balance remains, a past due bill showing the original charge, the amount of the payment, and the unpaid balance is mailed to the customer in accordance with the collection policy and depending upon the terms on which the partial payment was accepted. If a credit balance remains, the customer is notified of that fact and advised that the amount of the credit balance will be applied to his next bill or, if he prefers, will be refunded upon proper application.

Cash Refunds

Due to overpayments, or payments made on wrong accounts, it is frequently necessary to make refunds to customers. When it has been satisfactorily established that the customer is entitled to a refund, a Cash Refund Voucher form (Figure 26) is filled out in duplicate, and both copies are given to the customer with instructions to hand them to the cashier for payment. The cashier makes the refund from an imprest cash fund and secures the customer's signature on both copies of the refund voucher. He retains the duplicate and returns the original to the customer accounting office for entry to the customer's account. The entry is posted in black in the current accounting space in the center column, headed "Sundry Charges." (See Figure 21.) The total in the "Amount Due" column is then changed to include the amount of the refund in order to conform to the rule that the balance of the account is the total shown in the current accounting space in the "Amount Due" column, plus penalties, if any, and minus the credits posted in the current accounting

FIGURE 26

NO. 2600

ACCOUNT

ENTERED BY

PAID BY

CASHIERS **REFUND** VOUCHER LED. NO.

DATE

RECEIVED OF **THE BOARD OF WATER COMMISSIONERS**

DOLLARS $

DUPLICATE PAYMENT

BILL PAID IN ERROR

CREDIT BALANCE

N. G. CHECK

REMARKS:

PAID TO

CORRECT:
BUREAU HEAD

APPROVED:
AUDITOR

SIGNATURE

space. After the refund entry is made to the customer's account, the refund voucher is sent to the control keeper, who enters it as a debit adjustment to the route control (Figure 29) and as a debit in the "Cash" column on the district control (Figure 27).

The duplicate copies of the refund vouchers are accumulated in the cashier's office for a definite predetermined period. At the expiration of this period, the cashier prepares an invoice voucher for the total amount of the accumulated refund vouchers and forwards this invoice voucher, together with the group of paid refund vouchers, to the auditor for audit and approval. The invoice voucher is put through in the usual manner, and journal entries are made charging customer accounts receivable control and crediting cash. When the invoice voucher is paid, the cashier deposits the cash in his imprest cash fund, thus replacing money withdrawn for refund purposes.

Handling Checks Refused by Bank

When a customer's check is received by the utility's cashier, it is accepted at its face value and included in the day's receipts. The receipted cash coupons are forwarded to the customer accounting office for entry to the customers' accounts, and checks, together with currency receipts of the day, are deposited in the bank. The bank immediately credits the utility's account with the total amount of the deposit, all of which is taken at its face value. Frequently, checks received from customers and deposited in the bank are not honored by the bank on which drawn, in which event the checks will be returned to the utility's bank by the banks on which drawn, and the utility's bank will either return them to the utility and demand cash to cover them or will advise the latter that its bank account has been reduced by a corresponding amount. The practice in meeting this situation is for the utility's cashier to deposit in the bank an amount equal to the total of such checks, imprest fund cash being used for this purpose. The cashier then voids the utility's endorsements on the returned checks and attempts to get the writers of the checks to take them up in exchange for cash. Cash so received is returned directly to the imprest cash fund.

Frequently, however, it is impossible to get the writer of the check to take it up. When this impossibility becomes apparent,

the cashier turns over the checks to the auditor, who prepares a refund voucher, payable to the cashier as custodian of the imprest cash fund. The refund voucher form illustrated in Figure 26 is also used for this purpose. The voucher is made out in duplicate, the original copy being forwarded to the customer accounting office, where the customer's account is charged with the amount of the refund in exactly the same manner as all other refunds except that the entry includes the letters "NG" to indicate the nature of the refund. From this point on, the refund voucher is handled in the manner described on page 95. Similarly, the duplicate copy is also sent to the cashier, who follows the same procedure as for regular refund vouchers.

Customer Accounting Ledger Control

A customer accounting system that is not under complete control and in balance not only internally but also with the General Ledger, cannot be considered satisfactory no matter how well it appears to be operating otherwise. In spite of the stress that has been laid on this phase of customer accounting during the last few years, there still appears to be a lack of adequate customer accounting control in many water utilities.

Control involves two processes: first, providing not only for summarizing all the entries posted to the individual customers' accounts according to a predetermined classification, but also for posting the totals thus obtained to controlling accounts; second, proving the accuracy of all accounting operations.

Since the purpose of the controlling account is to provide a record in summarized form of all customer transactions, the controlling ledger should be designed to provide all the information desired. Usually the general accounting office will want certain information from the customer accounting department for recording in the General Ledger. The management will also want statistical data. For these reasons it is necessary not only to design a Customer Accounts Controlling Ledger in such form that data can be summarized therein for ready transfer to the Accounts Receivable controlling account in the General Ledger, but also to set up a subsidiary set of records to provide for all the detailed statistics desired.

The water department here chosen for illustration uses the

form shown in Figure 27.[1] A separate sheet is used for each of the thirty-six districts. Another identical sheet is used as the recapitulation sheet, to which are transferred the totals of all entries posted to the district sheets. This recapitulation sheet, therefore, becomes the Customer Accounts Controlling Ledger, to which the district controls are subsidiary. Chart V shows the source of entries to the district controls.

CHART V

SOURCE OF ENTRIES TO DISTRICT CONTROLS

No.	Class of Entries	Source of Entries
1. 2. 3. 4.	Rates Meter Repairs Building Tax Construction Service Charge	Recapitulation of billing proof sheets.
5.	Penalty	Control cards (as described under PENALTY POSTING, page 92).
6.	Cash Credits	Control cards (as described under CASH POSTING, page 91).
7.	Cash Debits	Cash Refund Vouchers (as described under CASH REFUNDS, page 95).
8.	Shut-off Charges	Adjustment slips. (See Figure 28.)

Occasionally entries of Classes 1 through 5 are made to the ledger cards at irregular times. Such entries are reported to the control keeper by means of adjustment slips, a form for which is illustrated in Figure 28.

At the end of each month the outstanding balance carried on the Customer Accounts Controlling Ledger is checked with the balance shown for the Customers' Accounts Receivable account in the General Ledger; and if the balances do not agree, the error must be located and corrected. In this manner, the control-

[1] For an alternative form see Figure 2 (Operating Revenue Register). Where the Operating Revenue Register is used, separate accounts are set up for each district. Postings of revenues are made thereto from the Operating Revenue Register and postings of cash receipts from the cashier's reports. In the city under consideration, the Operating Revenue Register is combined with the ledger accounts by providing columns to show not only the amount of revenue billed for, but cash receipts and unpaid balances as well.

FIGURE 27

BOARD OF WATER COMMISSIONERS
CUSTOMER'S ACCOUNT
CONTROL LEDGER

MONTH January DIST. 15
YEAR 1938

DATE	RATES DR.	RATES CR.	PENALTY DR	PENALTY CR	METER REPAIR DR	METER REPAIR CR	SHUT DR	SHUT CR.	BUILDING TAX DR	BUILDING TAX CR	C-S CHARGE DR	C-S CHARGE CR	TOTAL DR	TOTAL CR	CASH DR	CASH CR	BALANCE OUTSTANDING DR	BALANCE OUTSTANDING CR.	DATE
																	[illegible]		
1																1679	[illegible]		1
2																5119	[illegible]		2
3																3661	[illegible]		3
4	4927431			10	33372				400				4976203	10		15690	[illegible]		4
5																			5
6																			6
7																			7
8																			8
9																			9
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23																			23
24																			24
25																			25
26																			26
27																			27
28																			28
29																			29
30	2046		4457			556							4587	556		11831	[illegible]		30
31																			31
	4933235		4332		33429		200		400		450		5010956			3844827			

FIGURE 28

ADJUSTMENT SLIP

LEDGER CORRECTIONS

DATE________ LED. NO.________

LOCATION ....

CONSUMPTION	RATES	Penalty	Meter Repair	Shut	B. T.	C. S.	

CHANGED TO

REMARKS: ....

....

APPROVED........................ SIGNED........................

ling ledger of the customer accounting department is kept in balance with the General Ledger. The balance of the Customer Accounts Controlling Ledger must, in turn, be in agreement with the total of the balances of the thirty-six district control ledgers. Of utmost importance, also, is agreement between the balance of each district controlling ledger and the totals of the balances of the individual accounts which it controls. The procedure described below is used to prove that these balances are in agreement.

As indicated before, the accounts are grouped by districts. The next unit below the district is the meter reading route, which covers a definite territory of such size as to include approximately 175 accounts. The reading sheets for these accounts are locked into a binder which is opened only for the addition of sheets for new accounts. Ledger cards are arranged to conform to the meter reading route: hence each such group of ledger cards becomes a definite and permanent division and may be considered a customers' ledger consisting of approximately 175 customer accounts. This group of accounts is the ideal unit for balancing purposes because:

1. It is a natural division of the accounts.
2. It is a definite and permanent division of the accounts.
3. It contains a satisfactory number of accounts.

Although 175 accounts may be considered an unusually small group for use as a controlling unit because of the necessity of keeping a great number of controls, it is evident, on the other hand, that the smaller the controlling unit, the less the time required for locating errors. What is a satisfactory number of accounts will depend on many factors. Experience has proved, however, that much confusion and disappointment will be averted by starting with very small units and increasing their size if, and when, it has been demonstrated that larger units can be handled satisfactorily. The cost of maintaining a large number of sub-controlling accounts is not very great. For example, the 1700 route controls of the utility under consideration are maintained by one clerk.

A control sheet is illustrated in Figure 29. A control is maintained for each route, the route control including only a daily summary of the debits and credits posted to the group of ac-

FIGURE 29

ROUTE CONTROL SHEET

Balance 370.81 Nov. 4, 1937 15-15

DATE		DEBIT ADJ.	CREDIT ADJ.	CASH
Nov	10	1642 35	1 34	
	11			21 75
	12			59 61
	15			5 06
	16			8 69
	17			131 58
	18			38 32
	19		9 38	115 53
	22			103 45
	23			89 27
	24			67 91
	25	16 67	2 77	46 46
	26			245 99
	29			116 87
	30			53 23
Dec	1			271 56
	2	8 13		28 33
	3			19 87
	7	24 84		14 68
	8			21 47
	10			116 79
	13			53 93
	14			16 43
	15			11 78
	16			19 45
	17			42 99
	22			3 00
	23			12 77
	28			2 82
Jan	3	15 65		
	6	5 00		
	7			46 46
	11		16 26	
	18			15 75
	24	2 00		2 62
	25			19 67
		1714 64	29 75	1824 09
		370 81		29 75
		2085 45		1853 84
		1853 84		
		231 61	Balance at closing date	

counts that it controls. No distribution of charges is made thereon since the form is used only for balancing purposes. The outstanding balance can be obtained quickly for any given date.

When a district is billed, it is closed for all other entries, and the balances of the several route controls of that district are determined by the control clerk. As previously explained, the billing machine operator determines the unpaid balance of each customer's account and prints the arrears item, if any, on the bill and, by carbon impression, on the proof sheet. The total of the arrears items on the proof sheets for each controlling unit is checked to see that it is in agreement with the route control balance. If the balances do not agree, there is an error either on the control sheet or on one or more of the 175 ledger cards. With so small a group of accounts, the error is quickly located and corrected.

After all the route controls of the district have been balanced with the ledger cards, the total of the route controls is checked with the balance carried in the corresponding district control ledger. If these figures do not agree, the error must be in the district control sheet since it has already been proved that the route controls of the district are in balance with the individual customers' accounts; the error is quickly located and corrected, thus bringing the individual customers' accounts, the route controls, and the district controls into balance. Each district is balanced in a like manner, one after the other, on the cycle plan, thus proving the accuracy of the Customer Accounts Controlling Ledger. A monthly check between the Customer Accounts Controlling Ledger and the Accounts Receivable account in the General Ledger is the final step towards maintaining perfect control throughout the entire customer accounting system.

The principle of customer accounting control as described above may be clarified by summarizing the process as follows:

1. Checking balances carried on the individual customers' accounts with the balance of the corresponding route control
2. Checking balances carried on the route controls of each district with the corresponding district control
3. Checking balances carried on district controls with the Customer Accounts Controlling Ledger

4. Checking the balances carried on the Customer Accounts Controlling Ledger with the Accounts Receivable account in the General Ledger

As said before, although the above procedure and forms relate mostly to a particular utility, the principles brought out are believed to be typical of the ledger plan of account keeping.

Billing and Bookkeeping under the Stub Plan

Billing Procedure

As in the case of the ledger plan, and for the same reasons, the billing and bookkeeping procedure of a particular utility has been chosen for the purpose of illustrating such procedure under the stub plan. The utility chosen for this purpose is municipally owned, is 100 per cent metered, operates under a lien law, and has about 100,000 accounts.

The principal forms used by this utility in connection with billing are as follows:

1. A meter-reader's sheet (Figure 30)
2. A three-part post card bill (Figure 31)
3. An audit or proof sheet (Figure 32)

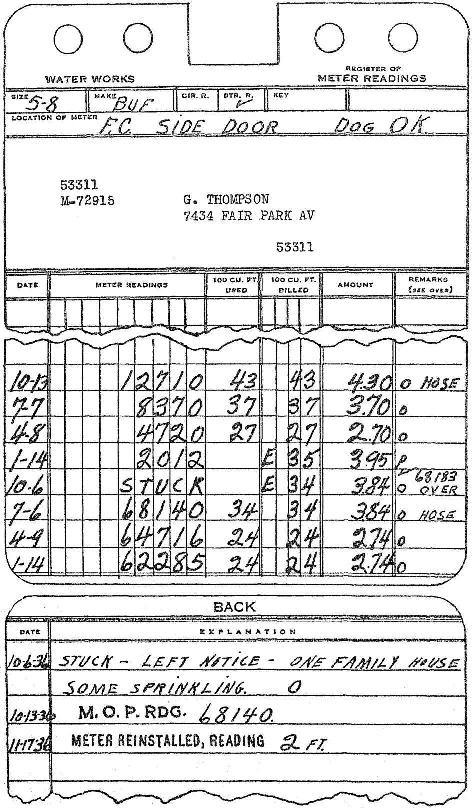
Billing operations begin as soon as the meter-reading books are turned into the office by the meter readers; for as soon as such books are turned in, both consumption and charges therefor are computed for each customer in the meter-reader's book.[2] The charge for each customer having been determined, the meter-readers' books are passed to the billing unit.

Three-part post card bills are used (Figure 31). The first part of the bill constitutes an office record; the second part constitutes the customer's bill, with a detachable cashier's stub; the third part consists of a delinquent notice, to be used only if, and when, an account becomes delinquent. The bills are addressed on an automatic addressing machine and are checked

[2] As will be indicated subsequently, the utility here described has a very simple rate structure for about 95 per cent of its accounts, making it relatively easy to record the amount to be billed, on the meter-reader's book. Whether or not it is desirable for utilities with more complicated rate structures to follow a similar procedure must be decided by each utility in the light of its own experience.

FIGURE 30

METER READER'S SHEET



WATER WORKS

REGISTER OF METER READINGS

SIZE 5-8 | MAKE BUF | CIR. R. | STR. R. ✓ | KEY

LOCATION OF METER F.C. SIDE DOOR DOG OK

53311
M-72915
G. THOMPSON
7434 FAIR PARK AV
53311

DATE	METER READINGS	100 CU. FT. USED	100 CU. FT. BILLED	AMOUNT	REMARKS (SEE OVER)
10-13	12710	43	43	4.30	O HOSE
7-7	8370	37	37	3.70	O
4-8	4720	27	27	2.70	O
1-14	2012		E 35	3.95	P 68183
10-6	STUCK		E 34	3.84	O OVER
7-6	68140	34	34	3.84	O HOSE
4-9	64716	24	24	2.74	O
1-14	62285	24	24	2.74	O

BACK

DATE	EXPLANATION
10-6-36	STUCK - LEFT NOTICE - ONE FAMILY HOUSE
	SOME SPRINKLING. O
10-13-36	M.O.P. RDG. 68140.
1-17-36	METER REINSTALLED, READING 2 FT.

with the meter books to insure a bill for every meter and a meter sheet for every bill. The delinquent notice stubs are detached at this time. If many accounts were expected to become delinquent, it would be advisable to record the amount due on the stub at the same time that the other sections are filled in. Since, however, experience has shown that only about 15 per cent of the accounts remain unpaid at the expiration of the due date, it is more economical to fill in the necessary information on the delinquent account stubs at the time accounts become delinquent, at which time the remaining 85 per cent of the stubs are destroyed. The officials of the utility under consideration believe that a saving is effected by having the delinquent notice stubs addressographed at the time bills are prepared, even though 85 per cent of such stubs are not used. Others may, on the other hand, find that it is more economical to prepare delinquent stubs apart from the regular bills.

The bills are arranged in groups of ninety. An audit sheet (Figure 32), part of a continuous roll, is placed in the billing machine with a one-time roll of carbon paper. The bills are fed into the machine; and the dates on which the last and current meter readings were made, the readings of the meter on the last date and the current readings, the consumption of water in hundreds of cubic feet, and the amount of the charge, are entered on the bill and office record. Only the amount charged is indicated on the cashier's stub. (See Figure 31, Part II.) The audit sheet fits the billing machine in such manner that a complete transcript of each bill is carbonized on this record. When the unit of 90 bills has been completed, totals are taken of the consumption and of the amount charged, both consumption and charge totals being used in proving the accuracy of billing and in analyzing revenue, as indicated below. An operator of this machine, under the present system, averages 1,400 to 1,600 bills per day.

Billing Proof and Revenue Analysis

At the conclusion of the billing operation, the bills, audit sheets, and meter books are referred back to checkers, who verify the posting of the data to the correct bill and check the details of the consumption with the revenues being billed. As indicated before, ninety bills comprise a checking unit, and

FIGURE 31

THREE-PART POST CARD BILL

PART I

OFFICE RECORD

B-3

BILL TO TURNKEY — DUE DATE NOV. 5, 1938

AMOUNT	DATES OF METER READINGS		CONSUMED AT LAST READING	
4 30	OCT 13	JUL 7	43	1 27

PART III

YOUR ACCOUNT, WHICH WAS DUE NOV. 5, 1938 HAS PROBABLY BEEN OVERLOOKED. WE WILL APPRECIATE REMITTANCE ON OR BEFORE NOV. 15, 1938	RETURN THIS STUB WITH REMITTANCE B-3 NOV. 5, 1938
IT IS OUR DESIRE TO FURNISH UNINTERRUPTED SERVICE. BUT SHOULD THE ACCOUNT REMAIN UNPAID ON THAT DATE, AN ADDITIONAL CHARGE OF $1.00 WILL BE MADE. THIS BILL CAN BE PAID ONLY AT THE OFFICE OF THE __________ WATER WORKS 144 CITY HALL	

FIGURE 31 (Continued)

THREE-PART POST CARD BILL

PART II (Front)

______________WATER WORKS

144 CITY HALL

OFFICE HOURS: 8 A. M. TO 5 P. M. SATURDAY TO NOON

THIS BILL IS DUE NOV. 5, 1938

IF RECEIPT IS DESIRED, RETURN ENTIRE BILL WITH SELF-ADDRESSED STAMPED ENVELOPE

METER READINGS		HUNDREDS CU. FT. REGISTERED	AMOUNT
PRESENT	PREVIOUS		
1 27	84		
OCT 13	JUL 7	43	4 30

METERED WATER RATES

RATE PER 100 CU. FT.	QUARTERLY BILLING	MONTHLY BILLING
10¢ FIRST	180,000 CU. FT.	60,000 CU. FT.
9¢ NEXT	1,320,000	440,000
8¢ NEXT	1,500,000	500,000
6¢ NEXT	6,000,000	2,000,000
5¢ OVER	9,000,000	3,000,000

MINIMUM BILLS $1.20 AND UP, ACCORDING TO SIZE OF METER.

IF PAID BY CHECK OR MONEY ORDER, RETURN THIS STUB WITH REMITTANCE BY

B-3

NOV. 5, 1938

4 30

PART II (Back)

RETURN TO
WATER WORKS
144 CITY HALL

53311
M-72915
86001

POST CARD

J CALDER
7434 FAIR PARK AV

53311

FIGURE 32

AUDIT (OR PROOF) SHEET   *Billed by C.S.F.*

66,862-66,891

394		371		
JAN 26	OCT 26		25	230
737		695		
JAN 26	OCT 26		42	420
227		209		
JAN 26	OCT 26		18	180
125		97		
JAN 26	OCT 26		28	280
885		870		
JAN 26	OCT 26		15 MIN	180
719		693		
JAN 26	OCT 26		26	260
863		832		
JAN 26	OCT 26		31	310
605		591		
JAN 26	OCT 26		14	140
752		744		
JAN 26	OCT 26		8 MIN	120
JAN 26	OCT 26		571 S	
JAN 26	OCT 26		MIN	
JAN 26	OCT 26		53 MIN	
			624	5710 *
				MIN
				660 MIN
				63.70

Checked by A.W.

Analysis

571 @ .10 = 57.10

Min 6.60

63.70

after these have been completed, two groups of totals, which have been automatically accumulated in the machine, are taken off. The first group consists of totals of accounts involving consumption of a sufficient amount of water to cover the minimum bill: Both total consumption, in cubic feet, and the total of the charges made for such consumption, are taken off. The second group consists of totals of accounts involving consumption of less than the required minimum: In this case, too, both the total amount of water consumed, in cubic feet, and the total of the charges billed on such accounts, are taken off.

Minimum bills vary with the size of the meter, the smallest minimum bill being $1.20. The advantage in separating the minimum charges from the actual consumption in excess of minimum bills is to expedite checking of the regular customers by rate blocks. In the municipality where the above method is in effect, the rate blocks are as follows:

Rate Per 100 Cu. Ft.	*Quarterly Billing*
10¢ First	180,000 Cu. Ft.
9¢ Next	1,320,000 " "
8¢ Next	1,500,000 " "
6¢ Next	6,000,000 " "
5¢ Over	9,000,000 " "

This schedule applies to bills rendered on a quarterly basis, which constitute 98 per cent of all bills rendered. On the monthly bills, which amount to about 2 per cent of the total, this consumption is divided by one-third. Such consumption is billed separately.

Approximately 95 per cent of the billing is in the first rate bracket, and it is a simple matter to take this total consumption and multiply it by 10 to prove the billing. On the remaining 5 per cent of accounts billed at less than the 10 cent rate, proof is derived by grouping the number of items applicable to each rate, multiplying the number of cubic feet in the group by the rate applicable to it, and adding the group totals.

These proofs of the billing of the regular charges, plus the minimum consumption and amount, are noted at the foot of each proof sheet and are, at the completion of the billing for that particular district, summarized into a journal entry, prepared in triplicate. The original of this journal entry is sent to the general bookkeeper for accounting control; the duplicate

FIGURE 33

DEPARTMENT OF WATER WORKS

DISTRIBUTION OF REVENUES

DATE ____________________

CASHIER ____________________

DISTRICT	PARTIAL		TOTAL	
A 1				
A 2				
A 3				
B 1				
B 2				
B 2 COUNTY				
B 3				
C 1				
C 1 COUNTY				
C 2				
C 3				
C 3 COUNTY				
ELEVATORS				
TOTAL-WATER RENTS				
IMPROVEMENTS-WATER WORKS				
" - BLDG. DEPT.				
TOTAL-IMPROVEMENTS				
MATERIAL FUND-ACCTS. REC.				
" " - METER SALES				
TOTAL-MATERIAL FUND				

FIGURE 34

________ WATERWORKS -- COMMERCIAL DIVISION

CASHIER'S REPORT

DATE ________

METER REVENUES		CURRENCY
ELEVATOR REVENUES		GOLD
		SILVER
TOTAL--WATER RENTS		CHANGE
IMPROVEMENT REVENUES-WATER WORKS		CHECKS
" " BLDG DEPT		
TOTAL--SALES OF WATER		
SERVICE BRANCHES		TOTAL
DRAWING AND REINSERTING FERRULES		
SERVICE BRANCH REPAIRS		
CURB BOX REPAIRS		
TOTAL--FERRULES & OPENINGS		
METER TESTING		
METER REPAIRS		
METER PACKING		
SALE OF MATERIAL-SUNDRY		
MAIN PIPE EXTENSION		
MAIN PIPE REPAIRS		
SUB-TOTAL-MISCELLANEOUS		
DAMAGES		
SALES-PLANS AND SPECIFICATIONS		
RENTALS		
SALES AND SERVICES		
TOTAL-MISCELLANEOUS		
TOTAL-RECEIPTS		
MATERIAL FUND ACCTS REC		
" " METER SALES		
TOTAL-MATERIAL FUND		

REMARKS ________

____
CASHIER

is sent to the accounting clerk, together with the office records, which contain practically the same information as the bills mailed to customers; the triplicate is filed with the audit sheets for checking purposes by the examiners.

Cash Posting

As payments are received—either by mail or at the cashiers' windows—the cashier's stub as well as the customer's portion of the bill, if returned with the stub, is stamped with the date of payment and the cashier's number. The stubs are then automatically routed to a locked drawer of the receipting machine used by the particular cashier.

This drawer is opened at least once daily by an audit clerk, and although there are three cashiers, all are checked by the one audit clerk. This is accomplished by staggering the work of checking, the audit clerk checking one cashier at a time. The procedure is as follows: After the audit clerk has withdrawn the stubs from the drawer, he sorts them by classes of revenue and secures, by means of a non-listing adding machine, a total for each class of revenue as well as a grand total for all revenues. He then re-sorts by districts the stubs applicable to meter revenue and secures a total for each district as well as a grand total for all districts. This grand total must equal the total of all meter revenues as secured through the first sorting. The form illustrated in Figure 33 is used in recording the results of both sortings.

At the same time that the audit clerk checks the cashier, the latter counts his cash. Needless to say, the total of cash found by the cashier must agree with the grand total of all revenue collections reported by the audit clerk. The audit clerk then fills out the part of the cashier's report (Figure 34) showing the classes of revenue, and the cashier fills out the part classifying receipts as to currency, silver, checks, etc. The cashier signs the report and hands it over, together with the money, to the head cashier. The head cashier consolidates all of the reports into one which he prepares in quadruplicate. One copy of this report goes to the general bookkeeper, one to the city auditor, the third to the audit clerk, and the fourth is retained by the head cashier. Before completing his work of checking, the audit clerk prepares a cash report (Figure 35) for the use of the auditor in posting to the general ledger accounts; a duplicate of this cash report goes to the general bookkeeper.

After the cashiers' totals have been proved, the stubs, now classified by districts, are sent, together with a copy of the audit clerk's report (Figure 33), to the account clerks. These clerks

FIGURE 35

________ WATER WORKS -- DAILY CASH REPORT

(CITY AUDITOR'S COPY)

DATE________

WATER RENTS							
SALES OF WATER							
FERRULES AND OPENINGS							
MISCELLANEOUS-SUB-TOTAL							
DAMAGES							
SALES-PLANS AND SPECIFICATIONS							
RENTALS							
SALES AND SERVICES							
REIMBURSEMENTS							
REFUNDS							
TOTAL-ACCTS. RECEIVBLE							
MATERIAL FUND-ACCTS. REC.							
" " METER SALES-CASH							
TOTAL-FUND 7170							

REMARKS ________

____

____
SENIOR CASHIER

arrange the stubs according to folio numbers and remove the corresponding account stubs from the files. In the event of an underpayment, the amount received is credited to the account stub and the latter returned to the unpaid file. In case of an overpayment, a memorandum of the amount credited, to be used later for balancing purposes, is placed among the stubs which have been removed, and the stub, with a proper notation, is placed in the unpaid file. When all the proper account stubs have been removed, an adding machine total is taken of the amounts by districts, and the total thus secured is compared with the audit clerk's total for the district. (See Figure 33.) If the two totals are in agreement, proof is secured that the proper account stubs have been removed. The removed accounting stubs are then stamped with the date of payment and filed in the paid or closed section of a cabinet.

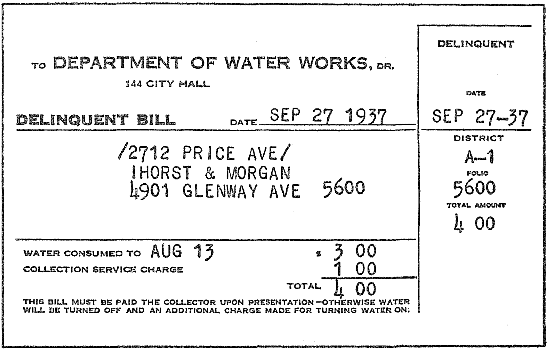
Penalties

Bills are payable within ten days. In order, however, to permit the recording of all mail remittances and collections through outside agencies, an additional three days are allowed to elapse before delinquent notices are sent out. The delinquent notice does not show any amount; it is merely a reminder that the bill is unpaid and that penalty will attach if the bill is not paid within ten days of the first due date. (See Part III of bill illustrated in Figure 31.) A penalty of $1.00 for city accounts and $1.50 for accounts outside of the city, is imposed on bills not paid within ten days after the expiration of the first due date. Special bills (Figure 36) are prepared in fanfold form, on typewriters, since their number does not warrant the use of an addressograph. The three copies, blue, gray, and white, carry a replica of the billing information on the office record and, in addition, the penalty charge. After all the bills have been prepared for the uncollected accounts, a journal voucher (Figure 38) is prepared, charging them with the total penalties.

Of the three copies, the blue is retained in the cashier's cage, and the gray and white are given to the turnkey foreman. The turnkey foreman hands the white copies to turnkeys, retaining the gray copy as a follow-up. The turnkeys then attempt to collect the bills. In order to protect the utility against possible losses, turnkeys are bonded.

On accounts collected by turnkeys, the remittances, together with the stubs of the white bills, are given to the turnkey foreman, who transmits them to the head cashier. The cashier then removes the corresponding blue slip from his files and destroys both the blue and the white copies. Conversely, as delinquent accounts are paid at the cashiers' windows, the blue slip is stamped "PAID" and sent to the turnkey foreman, who withdraws his gray copy, obtains the white bill from the turn-

FIGURE 36



TO DEPARTMENT OF WATER WORKS, DR.
144 CITY HALL

DELINQUENT BILL DATE SEP 27 1937

/2712 PRICE AVE/
IHORST & MORGAN
4901 GLENWAY AVE 5600

WATER CONSUMED TO AUG 13	$ 3 00
COLLECTION SERVICE CHARGE	1 00
TOTAL	4 00

THIS BILL MUST BE PAID THE COLLECTOR UPON PRESENTATION—OTHERWISE WATER WILL BE TURNED OFF AND AN ADDITIONAL CHARGE MADE FOR TURNING WATER ON.

DELINQUENT
DATE
SEP 27–37
DISTRICT
A–1
FOLIO
5600
TOTAL AMOUNT
4 00

key, and destroys them both, thus eliminating the possibility of annoying customers who have paid their bills. This procedure permits the head of the division to make a periodical check-up on the blue slips in the cashiers' cages in order to ascertain the status of delinquent accounts.

Overpayments and Partial Payments

Where remittances are less than the amount of the bill, the payments are credited on account, and a post card (Figure 37) is mailed to the customer informing him of the debit balance of his account. Similarly, if a customer overpays, his account is credited with the total amount of the payment, and a post card like that used for informing customers of underpayments

is sent out informing him that there is a credit balance to his account which will be transferred to his next bill. This procedure saves considerable letter writing.

Ledger Control

Indication has already been made as to how journal entries for regular bills are prepared for control purposes by districts, and then transmitted to the general bookkeeper. Final bills or special bills are treated in a similar manner, the account clerks

FIGURE 37

Notice of Over or Partial Payments

Date..

We have received remittance of $..

which has been credited to your account. Folio ....

This leaves a debit/credit balance of $..

and this amount will be added/credited to your next bill.

XYZ WATER WORKS
City Hall

Per ....

receiving office records with a duplicate copy of the journal entry and the original copy of the journal entry going to the general bookkeeper. Similarly, when the delinquent bills have been prepared, on the 6th, 16th, and 26th of each month, a summary journal entry for the collection charges which have been added to the unpaid office record is transmitted to the general bookkeeper.

Under cash posting, it was shown how the general bookkeeper receives the cash distribution for the various types of revenues and for the different collection districts. The only other credits possible are adjustments authorized by the head of the division. These are prepared in duplicate, the original of which is sent to the general bookkeeper, the duplicate to the account clerk. It will be noted from the foregoing that every operation of an

FIGURE 38

JOURNAL VOUCHER

________ WATER WORKS

COMMERCIAL DIVISION

GENERAL BOOKKEEPER DATE________

PLEASE MAKE FOLLOWING JOURNAL ENTRY:

DR. METER ACCTS. RECEIVABLE________

DISTRICT A 1 ________

A 2 ________

A 3 ________

B 1 ________

B 2 ________

B 2 CO.________

B 3 ________

C 1 ________

C 2 ________

C 3 ________

C 1 CO.________

C 3 CO.________

ELEVATOR ________

CR. WATER RENTS________

PENALTIES________

EXPLANATION: REGULAR BILLING ☐

FINAL BILLING ☐

________ ☐

____
SENIOR ACCOUNT CLERK

APPROVED________
ASST. SUPT. COMML. DIV.

account clerk is controlled by the general bookkeeper in such manner that there can be no abuses except through collusion.

Approximately 2,000 commercial accounts, in two different districts, are billed monthly, simultaneously with the regular quarterly billing for a particular district. There is thus a billing period for three different districts, and these districts constitute a collection unit. At the close of each billing period, the general

bookkeeper adds up the totals of the balances of each district comprising a particular collection unit. At the same time the account clerk adds up the balances as shown on the unpaid office records comprised within the collection unit. If the two totals are not in agreement, there is an error, which must be discovered before the records can be considered accurate.

Although a collection unit consists of 12,000 accounts, no difficulty has been encountered in balancing. There are three account clerks, each in charge of all the operations for a particular unit, which operations consist of pulling stubs, balancing them with cashier's payments, stamping them "PAID," and filing them in the cumulative "paid" or closed file. Each of these clerks also prepares duplicate and delinquent bills.

Thus far, the procedure described was that for handling revenue from the sale of water to regular customers. Miscellaneous customer charges, which include meter repair charges, water bills for construction purposes, sales of material, and other miscellaneous charges, are handled separately: A duplicate is prepared at the time the original bill is made out, which duplicate is kept in a loose-leaf binder and becomes a permanent record of miscellaneous charges. As payments are received, the cashier's coupon is used as a medium of posting each payment to the proper duplicate. The revenue classification, as explained previously, is in the form of a journal entry prepared at the time of billing.

Customer Billing and Bookkeeping under the Register Sheet Plan

The register sheet plan of account keeping contains many of the characteristics of both the ledger and stub plans. In view of this fact, the customer billing and bookkeeping procedure will be discussed only briefly. The principal forms used in connection with billing under the register sheet plan are as follows:

1. A meter reader's sheet (Figures 18 and 30)
2. Bill (Figures 19 and 31)
3. Register sheet (Figure 39)

Either of the meter reader's sheets previously illustrated (Figures 18 and 30) can be used under the register plan. The

FIGURE 39
REGISTER SHEET

________ WATER WORKS

CUSTOMERS ACCOUNTS

SECTION West PAGE NO. 1

DISTRICT 24

READING TO Apr. 7 1938

DUE DATE Apr. 24 1938

NAME	PREVIOUS / CODE	PRESENT	CONSUMPTION / NET	GROSS	NET	GROSS	REMARKS	PENALTY ADDED	PAID NET	PAID GROSS	PAID ON ACCOUNT	BALANCE
BEN MYAARD	4 77	4 81	4									
624 CORDELIA ST. SW CITY W24-1	A		1 59	1 75					APR 14			
			1 59	1 75 s	1 59	1 75 TOT						
G.R.MUT.FED.SG'S & LN. ASSN.	3 51	3 67	16									
630 CORDELIA ST. SW % 201 MONROE AVE NW CITY W24-1	C		4 16	4 58							APR 14-2.00	2.16
			4 16	4 58 s	4 16	4 58 TOT						
700 CORDELIA ST. SW CITY W24-1	A		3 29	3 62					APR 14			
			3 29	3 62 s	3 29	3 62 TOT						
EGBERT DE VRIES	1 523	1 549	26									
704 CORDELIA ST. SW CITY W24-1	A		3 46	3 81					APR 14			
			3 46	3 81 s	3 46	3 81 TOT						
J. A. PETRIE	228	245	17									
710 CORDELIA ST. SW % 417 FULLER AV SE CITY W24-1	A		2 70	2 97					APR 14			
			2 70	2 97 s	2 70	2 97 TOT						
EDE NYLAAN	725	825	1 00									
714 CORDELIA ST SW CITY W24-1	A		9 75	10 73					APR 14			
			9 75	10 73 s	9 75	10 73 TOT						
ALBERT PETRIE	2 645	2 792	1 47									
754 CORDELIA ST SW CITY W24-1	B		14 26	15 69					APR 14			
			14 26	15 69 s	14 26	15 69 TOT						
	260	10 927	5 86*									
			3 53	3 53*								
			60 77	68 11*	78 67	84 01*						

same holds true with the bills illustrated in connection with the description of the operation of the ledger and stub plans. (See Figures 19 and 31.) Furthermore, as in the case of the latter two plans, the bills are addressed prior to the time of billing and are arranged in the same order as the meter reader's sheets.

New register sheets are used each billing period, a sheet being designed to accommodate between 40 and 50 accounts. A separate line is provided for each account, and on it is carried the account description, consisting of any or all of the following items: customer's name, customer's address, and account number. For recording this information, an addressograph plate is frequently used, the bill being placed in the machine in such a position that the necessary information as to consumption, amount to be charged, and arrears, if any, will be reproduced by means of carbon paper on the proper line of the register sheet. Before billing is begun, however, all old balances are transferred to the proper lines of the sheet.

Totals are secured by means of registers with which the machine is usually equipped. Since an average route book usually contains about 150 accounts, there are about four register sheets to a route book (two if both sides of the sheet are used). Sub-totals are accumulated in the proper adding registers and are recorded at the bottom of each register sheet, the grand total for the accounts of a certain route being shown at the bottom of the last sheet of the group. As soon as the billing is completed, the bills, register sheets, and meter reader's book are turned over to special clerks for analysis and proof, the block method of proving being just as usable here as in the case of either the ledger or stub plans. The only difference is that here there is no need for the use of proof sheets because each amount is recorded on the register sheet and totals are shown at the bottom of each sheet so that the register sheet is, in fact, a proof sheet.

As bills are paid, both the cashier's coupon and customer's bill are stamped. The customer is given his copy as a receipt, and the cashier's copies are turned in, together with a report on collections, to the customer accounting office. Here the cashier's receipt stubs are sorted by route and customer number, and postings are made to the appropriate account on the register

sheet, postings being usually made by hand. Where the amount received equals exactly the amount due, posting may consist merely in stamping the word "paid" and the date in a special column on the line for the account affected. Payments representing an amount greater or smaller than that due are also entered by hand here. The accuracy of postings is proved by totaling the amounts credited and comparing them with the amount reported as received by the cashiers.

Applicability of Plans Described

Attention is called to the fact that it is not essential for a utility to follow precisely the procedures outlined under any of the three plans. Some variations may be necessary for utilities smaller or larger than those here considered. The principles illustrated, however, can be utilized in devising bookkeeping and billing procedures for any water utility.

Bill Delivery

The method of delivering bills will depend more on the size of the utility than on its plan of account keeping. As soon as the bills are audited, they are ready for distribution. Whether they should be sent out as soon as ready depends upon the policy of the utility and upon the cycle system in use. Some utilities make use of their meter readers for the distribution of bills, their normal work—reading meters—being concentrated in the early part of each month, with the latter part devoted to distribution. Normally, a meter reader can distribute about five times as many bills in a day as he can secure readings. Post card bills are sometimes used although ordinarily arrears cannot be shown on such cards. Those large utilities which do not mail out bills usually provide for their distribution by employees who are charged with that duty alone.

In a few cases, the date of payment is advertised locally, and bills are not sent out but are retained in the water works office, customers being expected to make payment within a certain period, after which penalties attach. Such procedures are not recommended, however. Customers have a right to expect that a statement of their account will be delivered to them and that it will be sufficiently itemized to make verification possible. Similarly, the practice of having meter readers both distribute

bills and attempt to make collections is not recommended.

In almost every utility there are bills which require special handling. The usual practice is to send these out in the manner requested by a customer. Real estate operators, trust companies, and others who manage property, frequently request that all bills for which they are responsible be sent to their offices; and since, in most cases, several bills for services at different locations are involved, some procedure must be developed so that these bills will receive the special handling requested. One method is to emboss on the addressograph plate two addresses, the second being the one to which the bill is to be sent; then every bill with a double address is pulled from the files and handled in the manner requested by the customer. A variation is to place the mailing address on the addressograph plate in such a manner that it will face the window of the envelope, the description of the location at which service is rendered being so placed as to be invisible.

The first plan has, however, certain objectionable features:

1. The envelopes must be addressed by hand or typewriter.
2. A new addressograph plate must be made, and the mailing address changed on the ledger record each time the second address is changed.
3. It is difficult to gather all the bills of the same second address, with the result that a number of pieces of mail may be sent to the same person on the same day, each envelope containing only one bill.

The second plan has the same objectional features as the first except that the necessity of addressing envelopes is eliminated.

To overcome these features, a plan has been devised which makes use of list numbers. Assuming, for example, that the X Trust Company requests that bills for all properties managed by it be sent direct to its office, the procedure would be as follows:

1. A list number (let us say 40211) would be assigned to the X Trust Company.
2. An addressograph plate would be made, bearing the name, address, and list number of the X Trust Company. (Figure 40)

3. The plate would be used to print two mailing list reference cards.
4. The addressograph plate (Figure 40) would be filed by list number in consecutive order with others.
5. One of the printed cards would be filed alphabetically by name (X Trust Company), and the other card numerically by list number (40211).
6. A Notification of Addition to Mailing List form (Figure 42) would be prepared for the individual accounts affected.
7. The filled-in form would be used as a posting medium from which the list number would be posted to the ledger record of each customer's account affected. The list number would also be embossed on the corresponding addressograph plates, and the latter would be refiled in regular order. Since all bills will be addressed from these addressograph plates, bills which are to be delivered to some other address than the premises served will bear a list number.
8. After the bills had been audited, all those bearing a list number would be pulled out and sorted in numerical order, thus bringing together all those bearing the same list number.
9. These bills would then be sent to the addressograph department, where the corresponding mailing list addressograph plates would be taken from the file and used to address envelopes. Thus, an envelope addressed with the name and address of the party concerned (X Trust Company) and the list number (40211), would be produced.
10. The bills would be inserted in the envelopes bearing the corresponding list numbers and mailed.

The cross index cards mentioned above would be kept in the customer accounting office. When notice was received from a customer that he no longer desired bills mailed to him for certain accounts, a Notification of Deletion from Mailing List form (Figure 43) would be filled out for the accounts to be removed.

The procedure from this point on would be similar to that outlined above in connection with the use of the first form except that in this case the list number would be removed.

Entries in Registers

Entries based on the summarized information derived from the individual accounts are made in the General Journal, Operating Revenue Register, and Cash Receipts Register, and

FIGURE 40

MAILING LIST ADDRESSOGRAPH PLATE

```
X  TRUST  COMPANY
206  MAIN  STREET
CITY       L-40211
```

FIGURE 41

BILL ADDRESSOGRAPH PLATE

```
1042  HUDSON  BOULEVARD
         L-40211
```

posted therefrom to the proper account in the General Ledger. The following is a list of some of the transactions for which entries are made:

1. Sales and Accounts Receivable
2. Penalties or Forfeited Discounts
3. Collections
4. Refunds
5. Other Adjustments

FIGURE 42

NOTIFICATION OF ADDITION TO MAILING LIST

ADD TO

List 40211 Ledger 72-16

3754 Hoosier Avenue

Req. by Owner Rec'd by M. R.

Date 12-29-37 Plate by G. F.

FIGURE 43

NOTIFICATION OF DELETION FROM MAILING LIST

TAKE OFF

List 40211 Ledger 11-37

8196 Fenestra Street

Req. by Owner Rec'd by A. C.

Date 1-11-38 Plate by J. R.

6. Uncollectible Accounts
7. Notes Receivable

Some of the entries for these transactions are illustrated below. Indication is made in all cases of the subsidiary accounts affected and of how the necessary data for making the entry are secured. In most instances, the entries to the subsidiary accounts will have been made before the general ledger entry is recorded.

1. *Sales and Accounts Receivable.* As mentioned before, all plans of customer accounting provide for the analysis of revenues at the time that proof of billing is obtained. Such analysis consists of (1) determining the total amount billed by districts and routes, and (2) classifying revenues by type (metered sales, private fire protection, customers' forfeited discounts, penalties, etc.; or, domestic, commercial, industrial, etc.). When the analysis is completed and the bookkeeper given the necessary data, the following entry is made:

Accounts Receivable (125)	$89,000	
Operating Revenues (501)		$89,000

An entry in the Operating Revenue Register to record billings for district 41, as follows:

Metered Sales to General Customers (601)	$70,000
Private Fire Protection (604)	2,000
Public Fire Protection (605)	14,000
Servicing of Customers' Installations (614)	3,000
	$89,000

2. *Collections.* As indicated before, individual credits are posted to each account under the ledger plan, the appropriate stub is removed from the unpaid files and stamped "PAID" under the stub plan, and the proper entry is made on the register sheet under the register plan. At this point, we are concerned with the entry to be made on the general records, the basis of the entry being the cashier's report. The entry to be made daily is as follows:

Cash (120)	$20,000	
Accounts Receivable (125)		$19,000
Customers' Deposits (227)		1,000

An entry in the Cash Receipts Register to record receipts.

3. *Penalties or Forfeited Discounts.* The entry to record penalties or forfeited discounts is as follows:

Accounts Receivable (125)	$2,000	
Operating Revenues (501)		$2,000

An entry in the General Journal to record penalties or forfeited discounts posted to accounts. SUBSIDIARY ACCOUNTS: *Credit* Customers' Forfeited Discounts and Penalties (612), $2,000.

The penalties or forfeited discounts will already have been posted to the individual customer accounts and the control ledgers. The assumption is that while customers' bills show gross amount of bill, discount, and net bill, only the amount of the net bill is set up on the ledger card, office record (stub), or register sheet, since most of the customers will take advantage of the discount.

4. *Refunds.* If refunds are not made on overpaid accounts, the customer's account being credited with the extra payment, no entries are needed. The total amount received is merely posted to the customer's account, and the adjustment is automatically taken care of when the next bill is rendered.

If refunds are made, the entry will vary somewhat with the procedure followed. Assume, however, that the procedure is the same as that described on pages 95–97. Under this plan, refunds are made from a cashier's imprest cash fund upon the presentation of a refund voucher to the cashier. One copy of the refund voucher is sent to the customer accounting office and used in posting to the customer's account, to the route control, and to the district control ledger. Duplicate copies are retained by the cashier and presented to the proper official, who authorizes the issuance of a single voucher to cover the group of individual vouchers. When such voucher is authorized and recorded, the entry is:

Accounts Receivable (125)	$1,000	
Vouchers Payable (222)		$1,000

An entry in the Voucher Register to record authorization to pay into imprest cash fund amount covering refunds made on individual refund vouchers.

The money is then paid over to the cashier, who deposits it in the imprest cash fund, thus restoring the fund to its original amount. To record payment of money to the cashier, the entry is:

Vouchers Payable (222)	$1,000	
Cash (120)		$1,000

An entry in the Check Register to record payment of vouchers payable.

5. *Other Adjustments.* Usually adjustments in an account will be made before the customer has paid his bill. To record the adjustment, the entry is as follows:

Operating Revenues (501)	$10	
Accounts Receivable (125)		$10

An entry in the General Journal to record allowance on a customer's account. The balance of the proper subsidiary revenue account (Metered Sales to General Customers, Private Fire Protection, etc.) would also have to be adjusted. Similarly, the balances of individual customers' accounts as well as the balance of the customers' control accounts would have to be adjusted.

6. *Uncollectible Accounts.* The procedure by which the loss on uncollectible accounts should be estimated each year, and the manner in which the loss finds its place among the operating expenses, are discussed in detail in Chapter 19. Here, only the entries illustrating how uncollectible accounts are written off will be discussed. As accounts are determined to be uncollectible, the following entry is made:

Reserve for Uncollectible Accounts (254)	$100	
Accounts Receivable (125)		$100

An entry in the General Journal to record writing off of following accounts:

District No. 1:	
A. L. Cord	$35
J. B. Matters	15
Total	$50
District No. 2:	
B. C. Thomas	$10
L. Cook	15
K. M. Jones	5
Total	$30

District No. 3:
John Jones $10
Etc.

The entry is posted to the control sheets and to the individual accounts as indicated above.

If any of these accounts are subsequently collected, the following entry is made:

Cash (120)	$10	
Reserve for Uncollectible Accounts (254).........		$10

An entry in the Cash Receipts Register to record the collection of an account previously written off.

The credit in this case is to the Reserve for Uncollectible Accounts since the collection of the account indicates that the entry which wrote off this particular account was erroneously made. In the credit file on the particular customer's account, a notation should be made that the account was paid.

Occasionally, the Reserve for Uncollectible Accounts should be checked in order to see that it is neither inadequate nor overadequate. This can be accomplished by examining accounts receivable and determining the chances of their being collected. Such a process is known as "aging accounts" for the simple reason that accounts are arranged in groups according to the length of time they have been outstanding—as, for example, one month, two months, etc. Obviously, the longer an account has been outstanding the less are the chances of its being collected. Thus, by segregating the accounts into groups according to length of time outstanding and then applying a varying percentage to each group in order to arrive at the expected loss on that group, the adequacy of the reserve can be established. For example, if the total of the estimated losses for each group is greater than the balance of the reserve, the latter is inadequate; if, on the other hand, such total is smaller than the balance of the reserve, the latter is overadequate. It must further be remembered, however, that reference is also made in this respect to individual accounts, especially to those which have been very long overdue, and that reports of results of attempts to collect are examined. If the difference between the reserve and the estimated losses is not substantial, it can be adjusted by merely charging the revenues of the current fiscal

period with a smaller loss than the actual loss on uncollectible accounts expected to be realized. Where, however, the difference is substantial, an adjustment should be made in the reserve.

The entry to adjust an inadequate reserve is as follows:

Miscellaneous Debits to Surplus (414).........	$1,000	
Reserve for Uncollectible Accounts (254)		$1,000

An entry in the General Journal to record the adjustment of an inadequate reserve for uncollectible accounts.

The following entry would be made to adjust an overadequate reserve:

Reserve for Uncollectible Accounts (254).........	$800	
Miscellaneous Credits to Surplus (401).........		$800

An entry in the General Journal to record the adjustment of an overadequate reserve for uncollectible accounts.

If no reserve is set up, the entry to write off bad debts is as follows:

Operating Expenses (502).......................	$100	
Accounts Receivable (125)....................		$100

An entry in the General Journal to record the write off of uncollectible accounts as follows:

District No. 1:	
A. L. Cord	$35
J. B. Matters	15
Total	$50
District No. 2:	
B. C. Thomas	$10
L. Cook	15
K. M. Jones	5
Total	$30
District No. 3:	
John Jones	$10
Etc.	

The entry is posted to the control sheets and to the individual accounts, as indicated above, as well as to Uncollectible Accounts control account (784).

If collection were made subsequently on an account written off, the entry would be as follows:

Cash (120).................................... $10
Miscellaneous Credits to Surplus (401)........... $10

An entry in the General Journal to record collection of account written off as uncollectible.

7. *Notes Receivable.* A water utility may accept notes in connection with some special sales transactions as a result either of an agreement with a consumer for spreading the payment of a past due balance over a considerable period, or as a result of other special transactions. When a bill is to be paid over a considerable period, there is an advantage in securing a formally signed claim against the customer, since a note will be good legal evidence of the debt, thus making it unnecessary later to prove the details of an invoice or series of charges.

The entries to record some of the transactions involving the use of notes receivable are as follows:

Notes Receivable (124)........................ $100
Accounts Receivable (125)................... $100

An entry in the General Journal to record the receipt of notes in payment of an open account. This entry must also be posted to the Accounts Receivable Control ledgers as well as to the individual customers' accounts.

If notes are accepted frequently, a Notes Receivable Register (Figure 44) should be maintained, so that each note may be registered in it. Space should be provided here for recording, among other things, the date the note was paid. A single entry would then be made in the General Journal at the end of each month, indicating the information to be posted to the Notes Receivable account in the General Ledger.

The entry to record the receipt of payment on a note is as follows:

Cash (120).................................... $50
Notes Receivable (124)........................ $50

An entry in the Cash Receipts Register to record the receipt of payment on note given by John Smith.

When interest is collected on notes the following entry is made:

Cash (120).. $3
Interest Revenues (524)......................... $3

An entry in the Cash Receipts Register to record the collection of interest on a note receivable.

FIGURE 44

NOTES RECEIVABLE REGISTER

YEAR ——

No.	Date Made	Maker	Maturity Date	Date Paid	Interest Rate	Amount	Interest Receivable					
							1/31	2/28	3/31	4/30	5/31	6/30
112	1/15	Ralph Jones	4/14	.....	6%	50.00	.13	.25	.25	...	...	...
113	1/15	John Clark	4/14	.....	6%	50.00	.13	.25	.25	...	...	...

Part III

ACCOUNTING FOR EXPENDITURES

CHAPTER 7

PURCHASES

Introduction

Accounting for expenditures involves seeing that they are incurred only for value received, that expenditure data are compiled in such manner as to reflect properly the financial operations of the utility for an accounting period, and, where a budget is in force, that expenditures are made in accordance with budgetary provisions. To accomplish these objectives, certain principles must be kept in mind and certain procedure followed. For example, distinctions must be made between current expenses and capital expenditures, and between current expenses applicable to a particular accounting period and those which are to be set up as assets (prepayments) and amortized over a number of periods. Also, expenses of a particular period must be allocated to the various functions to which applicable (such as source of supply, pumping, etc.). Moreover it is important to know within each function which part of the cost is for materials, which for labor, and which for overhead. In some cases it is even possible to carry the functional analysis further and to relate the expenditure with the amount of work done so that unit costs can be determined.

All of these phases of accounting for expenditures are discussed in the seven chapters which follow. This chapter deals with accounting for purchases, Chapter 8 deals with accounting for materials and supplies, Chapter 9 with payroll accounting, Chapter 10 with accounting for the cost of contractual services and interest on notes and taxes, Chapter 11 with accounting for depreciation, Chapter 12 with distribution of clearing accounts, and Chapter 13 with cost accounting.

Advantages of Centralized Purchasing

Some one agency should be responsible for purchasing. In a large utility, a purchasing department, in the charge of a purchasing agent, should be established; in small utilities, the task of purchasing might be delegated to one individual who might

have other duties; further, it should be noted that where a municipality has a central purchasing agency, that agency would ordinarily do the purchasing for the utility. The procedure described here is applicable to all three types of central purchasing agencies.

The advantages of centralized purchasing are as follows:

1. The purchase of large quantities, with a consequent reduction in price, is made possible.
2. A purchasing agent can devote much of his time to analyzing market conditions and finding better sources from which to purchase. Through his experience and training, he is in a better position than non-specialists to recognize and take advantage of favorable market conditions.
3. The problem of overstocking, with its resultant excessive inventories, is usually absent under centralized purchasing, thereby eliminating the tendency, commonly found under decentralized purchasing, for departments to order more than they need for a reasonable period of time.
4. The operation of a central storeroom can be carried out best only under a system of centralized purchasing, which insures the proper utilization of materials.
5. The purchasing agent will refuse to issue a purchase order without certification from the budget officer that the purchase is in accordance with budgetary provisions and does not exceed the maximum limit of expenditure set up for the department in the budget.

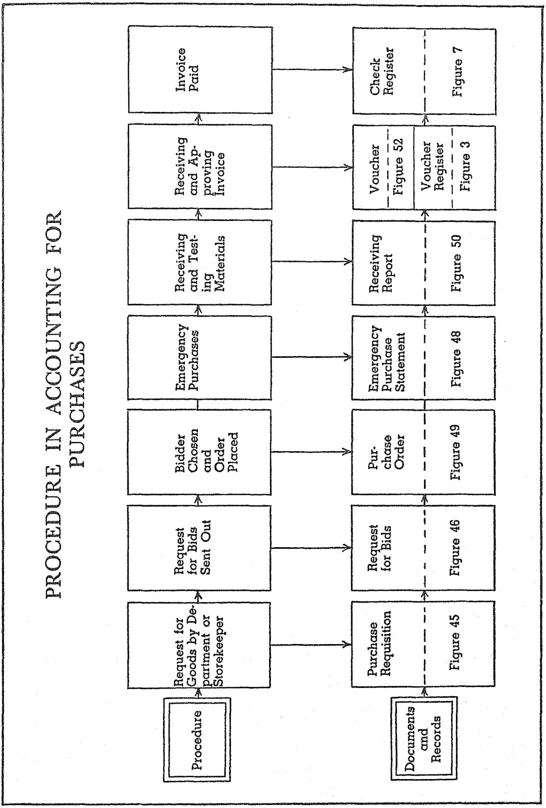
Because of these advantages, it is assumed that each utility will sooner or later establish a central purchasing department if it has not already done so. Accordingly, in both this and the following chapter, which deals with stores, the assumption is that the utility has delegated to some department or person the duty to act as purchasing agent.

Steps in Purchasing Procedure

The steps in accounting for purchases are as follows:

1. Preparing the requisition and placing it with the purchasing agent
2. Securing bids

CHART VI


PROCEDURE IN ACCOUNTING FOR PURCHASES
Procedure
Request for Goods by Department or Storekeeper
Request for Bids Sent Out
Bidder Chosen and Order Placed
Emergency Purchases
Receiving and Testing Materials
Receiving and Approving Invoice
Invoice Paid
Documents and Records
Purchase Requisition
Figure 45
Request for Bids
Figure 46
Purchase Order
Figure 49
Emergency Purchase Statement
Figure 48
Receiving Report
Figure 50
Voucher
Figure 52
Voucher Register
Figure 3
Check Register
Figure 7

3. Placing the order
4. Receiving the goods
5. Receiving the invoice and approving the liability
6. Payment of the liability

Chart VI illustrates purchasing procedure from the standpoint both of the activity involved and of the documents and records used.

Filing Requisition with Purchasing Agent

The first step in the purchasing process is the filing of a requisition (Figure 45) with the purchasing agent, asking him to secure certain materials or supplies. Requisitions are likely to originate from two sources: If the utility has a central storeroom in the charge of a storekeeper, the latter will file a requisition for items as soon as the amount on hand has reached a certain minimum. Where no central storeroom is maintained, requisitions will be filed by the operating departments needing any materials. However, even where a central storeroom is used, there may be occasion for operating departments to file requisitions, as, for example, in the case of materials not carried in stock. The purchase requisition should be made out in duplicate so that the department ordering the goods can retain a copy for its files.

Requisitions should be numbered by the purchasing agent in order of their submission. An alternative is to provide a separate series of numbers for each department, or to have the departments themselves number their requisitions in order of submission.

It is highly desirable that standard specifications be set up, at least for the more commonly used materials; for, by setting up standard specifications, to be followed by all the divisions affected in ordering goods, the requests of the various departments can be combined and a better price secured. This is primarily the work of the purchasing department, of course, but the latter cannot hope to accomplish much without the help of the operating divisions.

Competitive Bidding

In the case of most municipal utilities, the law usually requires that purchases over a certain maximum amount be let

FIGURE 45

PURCHASE REQUISITION

Requisition No. ....

Date ....

To Purchasing Department: Please order the items listed below.

They are needed for Stores / Work Order No................., and should be

received not later than ....

Shipping Instructions: Deliver at ....

Via ....

NOTE: All requisitions must be approved by the proper authorities before forwarding to the Purchasing Department.

Item No.	Quantity	Description

Requested By ____________________

Approved

____
Department Head

____
Purchasing Agent

Remarks

FIGURE 46 (Front)

Reference No. ____________

REQUEST FOR BIDS

Date ____________

Buyer ____________

Quotations, subject to the conditions on the reverse hereof, are requested on the following list of materials, supplies or services, for delivery to destination as shown below.

Goods to Be Delivered F.O.B. at ____________

Invoices Are to Be Mailed to ____________

____

Closing Time of Bids ____________

Quantity	Unit	Description	Unit Price	Amount
		THIS IS NOT AN ORDER		

Terms: ___% cash discount if paid within ___ days from date of delivery

Instructions to Bidders

1. Samples of items, when required, must be furnished, free of expense, prior to the opening of bids, and, if not destroyed, will, upon request, be returned at the bidder's expense.
2. Prices should be stated in units of quantity specified, with packing included.
3. Time of proposed delivery must be stated in definite terms. If time varies for different items the bidder should so state.
4. If the item bid upon has a trade name or brand, such trade name or brand must be stated in the bid.
5. To insure prompt payment, bills should be certified as follows: "I certify that the above bill is correct and just, and that payment therefor has not been received."

FIGURE 46 (Back)

REQUEST FOR BIDS

Conditions

1. The utility reserves the right to reject any and all bids, to waive any informality in bids, and, unless otherwise specified by the bidder, to accept any item in the bid. In case of error in the extension of prices in the bid, the unit prices will govern.
2. Time, in connection with discount offered, will be computed from date of the delivery of the supplies to carrier when final inspection and acceptance are at point of origin, or from date of delivery at destination or port of embarkation when final inspection and acceptance are at those points, or from date correct bill or voucher properly certified by the contractor is received if the latter date is later than the date of delivery.
3. In case of default of the contractor, the utility may procure the articles or services from other sources and hold the contractor responsible for any excess cost occasioned thereby.
4. Alternative bids will not be considered unless called for.
5. The right is reserved to require successful bidders to furnish security to guarantee faithful performance.
6. If the time within which bid must be accepted is not stated, it is understood and agreed that the utility shall have 60 days to accept.

BID

____

In compliance with the above invitation for bids, and subject to all the conditions thereof, the undersigned offers and agrees, if this bid be accepted within ______ days from date of the opening, to furnish any or all of the items upon which prices are quoted, at the price set opposite each item, and, unless otherwise specified, within ______ days after receipt of order, delivery ____________________

Discounts will be allowed for prompt payment as follows: 10 calendar days, ______ per cent; 20 calendar days, ______ per cent; 30 calendar days, ______ per cent.

____________________, ____________________
(Bidder) (Address)

By ____________________, Title ________________
(Member of firm or person authorized to sign bids for corporation)

ACCEPTANCE

____

Accepted as to items numbered ____________________

____________________, ____________________
(Name) (Title)

by competitive bid. The methods of calling for bids vary, one of the most common being to send out three copies of a Request for Bids form (Figure 46) to all vendors in a position to furnish the required materials. An alternative arrangement, especially where the number of potential vendors is great, is to send out a post card requesting prospective bidders to write or call for copies of detailed specifications if they are interested in bidding. The greater the number of bidders, of course, the

FIGURE 47

COMMODITY RECORD

Material ....

Description ....

For Division	Date	Quantity	Order No.	Purchased From	Net Price		Remarks

better chance there is for the utility to secure the best possible price. Accordingly, it is highly important that a list of vendors, and the articles which they are in a position to furnish, be kept. For this purpose each vendor is usually provided with a separate card on which are shown unit prices and the kinds of materials the vendor is in a position to furnish. A separate card should also be provided for each commodity, showing the cost per unit and from whom available. A form for such card is illustrated in Figure 47. Another, usually supplemental, method of securing bids is through advertising in newspapers, adver-

tising sometimes being a legal requirement for municipal utilities.

The terms and conditions of the purchase should be printed on the form so that misunderstandings may be avoided. Quotations should preferably be solicited on the basis of the payment of freight by the vendor, thus making it unnecessary to compute and add in freight charges in arriving at the lowest bid.

Usually a certain time is specified within which bids must be filed, and bidders must see that their bids are in before the time limit if they are to receive consideration. Where bidding is a legal requirement, the hour on which bids will be opened is indicated in the bidding announcement.

Bidders enter the unit price on the front part of the Request for Bids form. On the back of the form, illustrated in Figure 46, provision is made for the signature of bidder and for indicating his agreement to furnish the materials in accordance with the conditions specified on the bid. Frequently bidders must submit a certified check as a guarantee of their good faith and ability to furnish the goods desired, and as these checks are received, a record is made of them, and they are placed in the custody of a responsible employee.

Awarding Bids

Bids are submitted sealed, after which, at the time specified, they are opened and tabulated—bids, in the case of municipal utilities, usually being required to be opened in public. Normally, the contract will be awarded to the lowest and best bidder, but it should be kept in mind that the lowest bidder is not necessarily the best. The ability of the vendor to furnish goods promptly, as needed, and the quality of the goods furnished, as evidenced by past performance, are important factors. In the case of municipal utilities, although the purchasing agent must be governed by legal provisions, it is not uncommon to find statutes, charters, or ordinances specifying that awards be made to the "lowest and best bidder" rather than merely to the lowest bidder. In the case of municipal utilities, bids involving over a certain amount must be approved either by the city council or by the water board, if one exists. Provision is made on the back of the form, as illustrated in Figure 46, for indicating the acceptance of the bid, one copy of which should be filled out

FIGURE 48

EMERGENCY PURCHASE STATEMENT

(Informal Solicitation for Bids)

Date.................... Hour....................

Verbal bids for the following services, materials, or supplies were received from the vendors noted.

Description of Items Quoted On

Item No.

1. ....
2. ....
3. ....
4. ....
5. ....

Verbal Bids Received

Vendor's Name	Item No.	Quantity	Unit Price	Total Price

Awarded to .... on Purchase Order No....................

I HEREBY CERTIFY that the above items were purchased from verbal bids because of (explanation of emergency) ....

....

....

....

....

....

Department Head or Purchasing Agent

FIGURE 49

PURCHASE ORDER

Purchase Order No. ....

Req. No. ....

Date ....

TO

Ship to ....

Via ....

F.O.B. .... Shipping Date ....

Terms: ....% cash discount if paid within .... days from date of delivery.

Quantity	Unit	Description	Unit Price	Amount

This order is issued in accordance with your quotation dated ______ The number of this order must appear on all invoices and correspondence.

Purchasing Agent

and mailed to the successful bidder, the other two retained by the purchasing agent, one for his own use, and another for the accounting department.

Guarantee checks, together with a notice to the effect that their bids have not been accepted, should be returned promptly to the unsuccessful bidders. Even where guarantee checks are not required, it is advisable to notify unsuccessful bidders that their bids have not been accepted.

The above procedure of asking for and accepting bids is applicable both to bids calling for the immediate delivery of materials and to those calling for delivery over a period of time. In the case of emergency purchases where the amount involved is small, bids may be accepted over the telephone. A form to be used for this purpose is illustrated in Figure 48.

While most purchases involving any substantial amount must, in the case of municipal utilities, usually be awarded on a competitive bid basis, there are occasions where such a basis cannot be employed. This is true in the case of some patented and proprietary articles which are handled through only one source, and also in the case of emergency purchases when only one nearby source is available. Even emergency purchases, however, should be handled through the purchasing department.

Placing Orders

The vendor having been selected, the next step is to place a purchase order with him. This order should be prepared by the purchasing agent, and the form used (Figure 49) should provide for filling in, among other things, the following information: purchase order number, requisition number, date, a description of the goods ordered, unit price, shipping instructions, term, quantity of goods ordered, reference to bid submitted by vendor, and purchasing agent's signature. In the case of municipal utilities, provision should also be made for indicating approval as to conformance with budgetary provisions. (See pages 436–439.)

The purchase order should be prepared in multiple, one copy, usually the original, being sent to the vendor as his authority for shipping the goods, and another copy being retained by the purchasing department so that postings can be made from it to the records of purchases by commodities (Figure 47) and to

FIGURE 50

RECEIVING REPORT

No. ....

Date ....

Requisition No. ....

....

Purchase Order No.

....

Received From ....

....

Via ....

Received at ....

Expense	Amount
Freight	
Parcel Post	
Express	
Drayage	
Other Expense	

Quantity	Description

Remarks

Received by

....

Approved

....

Check Line Below That Applies

Package Damaged..............

Materials Damaged..............

Shortage..............

Overage..............

Not According to Order..............

Materials O. K..............

the records of purchases by vendors, described on page 144. The former documents are usually filed by name of material, the latter by name of vendor. A third copy, to be used later in checking the vendor's invoice, should go to the accounting department, a fourth to the receiving clerk. From this latter copy quantities are sometimes omitted in order to eliminate a tendency on the part of the receiving clerk to assume that the amount ordered has been shipped and to fail to count the items received. Where a central storeroom is maintained, it may be advisable to prepare a fifth copy; this would be similar to the receiving clerk's copy and would be used by the stores clerk in recording receipts on stock cards.

Accepting Deliveries

Acceptance of deliveries should be the responsibility of the receiving department. The person receiving materials should not only make an actual count, at the same time inspecting the materials to see that they are not damaged, but also, in so far as practicable, note whether they comply with specifications. The latter type of test may, of course, be possible only with certain materials, others probably requiring chemical or physical tests necessitating the use of laboratory equipment and trained laboratory technicians.

A large utility is usually in a position to do most of the testing itself, leaving only a small portion to be handled by special testing laboratories; small utilities, on the other hand, may find it advisable to let commercial laboratories handle the major portion of their testing. Whenever tests are made, the materials are not considered accepted until a satisfactory report is received from the laboratory. Sometimes an agreement for making the necessary tests is made with an independent laboratory located at the point of shipment, and the order for shipment is not given until the utility has received the report from the laboratory certifying that the materials are in accordance with specifications.

The quantities received should be filled in by the receiving clerk on his copy of the purchase order or on a special receiving report (Figure 50) which should then be transmitted to the purchasing department. The latter will compare the quantities shown on the receiving report with those listed in the purchase

order, and in case the materials apply to a contract for delivery over a period of time, will make proper notation on the bidding form so that the amount still to be received can be readily determined at all times. Inspection and laboratory test reports should also be sent to the purchasing department. If everything is satisfactory, the purchase order, receiving report, and inspection or laboratory reports, will be transmitted to the accounting department.

Some utilities vary this procedure, providing that invoices be routed first to the purchasing department in order to check not only for accuracy of unit prices, but also with receiving reports to see that the quantity billed for is the quantity actually received; the invoice, with the receiving report and the inspection or testing report attached to it, is in turn transmitted to the accounting department. In other cases, invoices are routed directly to the accounting department and are not handled by the purchasing department.

Auditing Invoices

Since most vendors allow a cash discount for the prompt payment of bills, it is important that invoices be audited promptly so that payment can be made within the discount period. To facilitate the work of auditing invoices, some utilities furnish the vendor with invoice blanks. Where this practice is not followed, a list of the items to be checked should be compiled, and, as an invoice is audited, care should be taken to see that each item called for on the list is covered. Usually a rubber stamp, known as an "auditor's block," which lists each of the steps to be followed in the auditing process and provides a blank space after each item, is used (Figure 51). Prior to beginning an audit, the clerk stamps the invoice. Then, as each step in the auditing procedure is completed, the appropriate item, as indicated by the stamp, is checked.

The accounting department is primarily concerned with seeing that the invoice is for materials actually received, that the quantities are in agreement with the report of the receiving department, that the unit prices are those indicated on the purchase order, and that extensions and footings are correct. It is the primary responsibility of the purchasing, and not the accounting, department to see that goods are in accordance with

specifications. In the case of municipal utilities subject to budgetary control, the balance to the credit of the appropriation affected will have been reduced by the amount of the estimated cost of the purchase. Since the actual cost, as indicated by the

FIGURE 51

AUDITOR'S BLOCK		O.K.
Quantity		
Quality		
Prices		
Extensions		
Total Bill	$	
Discount Allowed	$	
Net Bill	$	

Charge to Account

No.	$
Total	$

invoice, may be greater or smaller than the estimated cost, the unencumbered balance of the proper appropriation must be adjusted. (See also Chapter 20.) These adjustments are part of the auditing procedure.

As indicated before, it is assumed that the voucher system is used. After the invoice has been audited and found correct, a voucher should be prepared. Although there are many variations in the form of voucher used, the discussion here will be limited to two types. Under one method, two copies of the voucher are prepared, one copy providing space on the back for charging the various accounts involved (Figure 52, back), and the second copy being similar to the first except for lack of printing on the back. This copy is transmitted to the vendor, together with the check, which may or may not be made out at the time

FIGURE 52 (Front)

ACCOUNTS PAYABLE VOUCHER

No. ....

Date ....

Payee	Requisition No. ....
....	Purchase Order No. ....
....	Terms ....
....	Date Due ....

Invoice Date	Invoice Number	Description	Amount
		Cash Discount	
		Net	

Audited and Found O.K. ....

Entry Authorized ....

Payment Authorized ....

FIGURE 52 (Back)

ACCOUNTS PAYABLE VOUCHER

Charge These Accounts				Summary
No.		G.L.	S.L.	Voucher No....................
100.1	Utility Plant in Service			Voucher Date....................
502	Operating Expenses			Due Date....................
				Date Paid....................
				Check No....................
				Amount . . . . .$....................
				Discount . . . . ____________
				Net. . . . .$....................
				PAYEE
				....
				....
				....
				Journalized....................
				Posted....................
				....
	TOTAL			

FIGURE 53

XYZ WATER WORKS

Voucher Check

Voucher No. ....

Check No. *1647*

PAY .... $ ....

TO THE
ORDER OF

PAYABLE AT

First National Bank

XYZ Water Works

By ....

NOTICE: This is an itemized statement of the attached check.
Detach this stub before presenting check at bank. NO. *1647*

Account	Amount	Invoice Date	Particulars	Gross	Discount	Net
		XYZ WATER WORKS	Total This Check			

the voucher is prepared. A second method is to prepare in duplicate a voucher check which is a combination check and remittance advice, divided horizontally (Figure 53). The upper part is presented by the payee to the bank for payment; the lower part, which lists the items covered by the remittance, is retained by the person receiving the check. The carbon copy, the back of which provides space for the proper distribution of expenditures among the various accounts, serves as the basis for the entry in the Voucher Register.

Care must be exercised at this point to see that any freight charges paid by the water utility are deducted from the invoice if the vendor has agreed to pay transportation charges. If discounts are invariably taken, the voucher should show gross amount, discount taken, and net amount payable. If discounts are not taken regularly, the voucher should be made out for the gross amount. Needless to say, every utility should strive to pay its bills in time to take advantage of cash discounts.

After the voucher is prepared, it should be initialed by the voucher clerk and transmitted to the proper official for signature. Once the voucher is signed, it is ready for entry in the Voucher Register.

The Voucher Register should provide columns for distributing the liability among the various asset or expense accounts involved. In this manual it is assumed that provision is made in the Voucher Register only for distributing the expenditures among the general ledger accounts. Distribution among the detailed subsidiary accounts is assumed to be made either from the voucher directly or from a special analysis sheet, as indicated previously.

The voucher or voucher check and duplicate, together with all the supporting documents, should be placed in a tickler file which is so devised that the voucher will come up on the day it is desired to make payment. When that day arrives, the voucher and related documents are removed from the file, and the check, if not yet written, is prepared. Before writing the check, or in the case of the check's already having been prepared before transmitting it for signature by the proper official, care must be taken to see that nothing has occurred since the preparation of the voucher to change the amount payable. Assuming no change necessary, the check will be signed by the

treasurer or other authorized official, recorded in the Check Register, and transmitted to the vendor. Frequently checks are numbered as entered in the Check Register. Where several banks are involved, the name of the bank from which payable may be stamped on the check at this time. The Check Register should contain a separate column for each bank, and the amount of the check should be entered in the proper bank column. Sometimes a separate sheet is provided for each bank. A variation from the above procedure is to make the entries to the Check Register not from the check directly but from the check stub or duplicate of the voucher check.

Where many purchases are made from the same vendor over a relatively short period of time, and where no loss of discount is occasioned thereby, invoices for the same vendor may be held until a number of them is accumulated. A single voucher covering the group would then be made out. Invoices of a current month should not be held over until the succeeding month or months.

Entries

The following are some of the entries involved in recording the purchase of materials and supplies. When the materials and invoices are received and the latter audited and found to be in order, a voucher is prepared and recorded in the Voucher Register, the entry being as follows:

Materials and Supplies (131)....................	$120	
Vouchers Payable (222).......................		$120

An entry in the Voucher Register to record purchase of materials and approval of liability.

When the voucher is paid, the entry is:

Vouchers Payable (222).........................	$120	
Cash (120)..................................		$120

An entry in the Check Register to record the payment of a voucher.

Freight in, that is, the cost of transportation, should be treated as part of the cost of the materials. When the freight bill is received and approved for payment, the entry is:

Materials and Supplies (131)	$20	
Vouchers Payable (222)		$20

An entry in the Voucher Register to record freight expenses.

The classification of accounts of the National Association of Railroad and Utilities Commissioners does not provide for the reporting of purchase discounts separately. Consequently, the following are alternative methods of treating purchase discounts. The first method, to be used where discounts are taken regularly, is to record the net amount payable, that is, the gross bill less purchase discount. Thus, assuming that the total amount payable is $100 on which there is a discount of 3 per cent if paid within 10 days, the entry to record the purchase would be:

Materials and Supplies (131)	$97	
Vouchers Payable (222)		$97

An entry in the Voucher Register to record the purchase of materials.

The second method, to be used where discounts are not expected to be taken regularly, is to indicate both the gross amount and discount on the voucher, but to record the full amount in the Voucher Register. The entry would be as follows:

Materials and Supplies (131)	$100	
Vouchers Payable (222)		$100

An entry in the Voucher Register to record the purchase of materials.

If, under the first method, due to an oversight or lack of funds, advantage is not taken of the discount, two procedures are possible. One would be to cancel the old voucher and issue a new one to cover the full amount of the invoice, including the forfeited discount. The old voucher would be canceled in the Voucher Register by drawing a line through the entries represented by such voucher. The new voucher number would be inserted on the same line in the column provided for entering the date of payment. Where, however, the column totals had already been posted, a general journal entry would be necessary. The entry would be as follows:

Vouchers Payable (222)	$97	
Materials and Supplies (131)		$97

An entry in the General Journal to record cancellation of voucher due to forfeit of discount.

The entry to record the new voucher would be:

Materials and Supplies (131)	$100	
Vouchers Payable (222)		$100

An entry in the Voucher Register to record issuance of new voucher to replace voucher issued which did not cover forfeited purchase discount.

The other alternative would be to issue an additional voucher to cover the forfeited discount. The entry would be as follows:

Materials and Supplies (131)	$3	
Vouchers Payable (222)		$3

An entry in the Voucher Register to record issuance of additional voucher to cover forfeited discount.

No adjustments for forfeited discounts would need to be made where the full amount of the invoice was vouchered. Suppose, on the other hand, that the full amount of the invoice has been vouchered, but the discount is taken. One procedure would be to reduce the voucher by the amount of the discount. This adjustment can be effected in the Voucher Register by inserting in red ink immediately above the line containing the original entry in the "Vouchers Payable" column, and other columns affected, the amount of the discount. In posting the totals of each column, the red figures would be deducted, leaving the net amount. Another method is to cancel the original voucher and prepare a voucher for the reduced amount. The procedure in canceling the entry made from the voucher now canceled is similar to that followed in recording the cancellation of a voucher because of the forfeit of purchase discounts. Where the Voucher Register has been totaled and posted, the entry would be made in the General Journal.

Other accounting adjustments are frequently occasioned by purchase returns or by some special allowance which the vendor may make. The procedure is the same as for vouchers on which the gross amount, including purchase discount, has been entered and the discount subsequently taken. The only additional point

to remember is that if the discount cannot be identified with any particular group of commodities, Stores Expenses—Clearing (903) may be credited in the place of Materials and Supplies.

Thus far, the discussion has been concerned with accounting for purchases. Although purchases do not constitute expenses until the material is used, nevertheless it is important to account for them since the amount of the liability must be determined and the total cost of materials acquired must be known. A very important phase of the accounting procedure is determining the total cost of materials used during a certain period and allocating the cost among the various activities using them. It is evident, therefore, that there is a close relationship between this chapter and the next, which deals with accounting for materials.

CHAPTER 8

ACCOUNTING FOR MATERIALS AND SUPPLIES

Introduction

It is highly important to provide a proper procedure for the handling of materials. Unless a system of internal check is established in connection therewith, there is likely to be waste and misappropriation of materials and supplies. The effective utilization of materials requires the establishment of a central storeroom in the charge of one individual, with as many assistants as needed, who can be held responsible for the proper operation of the storeroom.

The advantages of centralized purchasing enumerated at the beginning of the preceding chapter are for the most part applicable to centralized storing. In addition, there are other advantages arising from the fact that better storage facilities can usually be provided under a central stores system, that no delay in work, resulting from a shortage of material, occurs (since the storekeeper notifies the purchasing agent as soon as the amount on hand falls below the minimum required), and that control over receipts, issues, and transfers of materials can be better exercised. In general, centralized purchasing and centralized storing go together. Accordingly, the discussion in this chapter is based on the assumption that the utility operates a central storeroom.

Essentials of a Good System of Stores Control

The following are some of the principles of proper stores control:

1. Proper storing of materials and supplies
2. Development of proper procedure for checking in materials and recording receipts
3. Development of proper procedure for issuing materials and for transferring them between jobs

4. Frequent physical inventories to insure that materials shown by records are actually on hand
5. Charging of materials and supplies to proper accounts and jobs

Proper Storing of Materials and Supplies

As far as possible, all materials should be carried in one storeroom. It may be necessary, however, to establish sub-storerooms at various places—as for example, in the case of the materials and supplies to be used by pumping stations, which materials are usually located at the stations. Similarly, if the utility serves an extensive territory, sub-storerooms may be desirable from which materials and supplies can be drawn as needed. In all cases, however, the central stores office should have full control. It should not only be informed of all receipts by these sub-storerooms, but also of all receipts which do not pass through any storeroom but are used directly as purchased.

Checking Materials and Recording Receipts

It is assumed that purchased materials, excepting those delivered to jobs in the field or to sub-storerooms, will be accepted at the central storeroom and that the storekeeper or his assistants will inspect and count the materials and fill out the receiving report. Two copies of the receiving report or of duplicate copies of the purchase order (if these are used as receiving reports), should be filled out—one copy to be sent to the purchasing or accounting department for checking with the invoice to see that the quantity billed for is the quantity ordered and received, the other to be retained by the storekeeper and used as the basis for recording on the stock cards the quantities of materials added to stock.

Many utilities provide for a stores office, which, in a sense, is a cost accounting office. Where such an office is provided, the storekeeper's duty frequently becomes one of merely handling stores: all entries on stock cards, the pricing of requisitions, and any other work involved in recording the cost of materials used is then handled by the stores office. In general, the procedure is the same regardless of whether the stores records are kept by the storekeeper or in a stores office. In this chapter, however, it is assumed that a stores office has been established. Where

FIGURE 54

FIELD RECEIVING REPORT

No. ....

Date ....

Received From ....

....

Via ....

Received At ....

Quantity	Description

Remarks	Received in field by
	Engineer Foreman

FIGURE 55

STOCK CARD

Name of item__________ No. of item__________ Unit__________ Minimum__________

ORDERS		RECEIVED			CONSUMPTION			
Date	Requisition Number	Date	Quantity	Unit Price	Date	Amount	Date	Amount
					January February March April May June Total		July August September October November December Total	

ISSUES				ISSUES				ISSUES			
Date	Rec'd.	Issued	Balance	Date	Rec'd.	Issued	Balance	Date	Rec'd.	Issued	Balance

FIGURE 56

MATERIALS AND SUPPLIES REQUISITION

To Storekeeper: No..

Date..

Please furnish the materials and supplies listed below to bearer

and charge to WORK ORDER / ACCOUNT No............... These items are

to be used for..

POSTED { Inventory Record....................
Materials Issued Register
....

Quantity	Unit	Description	Unit Price	Amount
		TOTAL		

Approved: Received the above material

....

materials are delivered to sub-storerooms or directly to some operations center in the field, a report of receipts should be submitted to the stores office. A form for such a report is illustrated in Figure 54.

A separate card should be provided for each type of material carried in stock. This card will provide space for showing, among other things, the description of the item, stock number, minimum amount to be held on hand, unit cost, amount received, amount issued, and balance on hand. Where an item has been handled in the storeroom, the card will already have been filled out, and the only information to be supplied is the amount received and the resulting balance. A form for a stock card is illustrated in Figure 55.

As items are issued, an entry is made in the "Issued" and "Balance" columns, making it possible to tell at all times the amount of each item on hand. Furthermore, by comparing the amount of each item on hand with the minimum required to be on hand, as indicated on each card, it can be readily determined whether the item should be re-ordered and, if so, the amount to be re-ordered. The minimum and maximum amount of each item to be held on hand should be determined by the purchasing agent after consultation with the divisions concerned.

Issuing Materials and Transferring Same between Jobs

Materials should be issued only upon authorization of a proper official. The request for materials from stores and the authorization of the issuance of same, is usually evidenced by a stores requisition. A form for such requisition is illustrated in Figure 56.

The requisition can also be made to serve as a receipt for materials issued and as the basis for entries to the stock cards. To accomplish these purposes, the requisition form should be made out in duplicate and be signed by the foreman or other person in charge of the activity in connection with which the material is to be used. Space should be provided for the signature of the employee receiving the materials, so that after presentation of the requisition and issuance of the materials by the storekeeper, the person receiving the materials may sign the requisition. One copy of the requisition is kept by the store-

keeper, and the other is given to the employee receiving the materials. The storekeeper's copy is transmitted to the stores office and used there in making entries on the proper stock cards, thereby reducing the stock by the amount issued. In addition, the requisition is used as the basis for charging the proper jobs or cost accounts, as indicated subsequently.

In the case of large construction projects, a foreman is frequently provided at the inception of the project with all the equipment needed and with sufficient materials to cover a substantial part of the job. In such instances the following procedure has been found workable: Each foreman signs a requisition on which are listed all his requirements. The equipment and materials are issued to him, and the requisitions are turned in to the stores office, where they are used to credit each of the stock cards with the amount withdrawn. For each foreman a card is then made out on which are entered all the items of equipment and materials drawn by the foreman, as evidenced by the requisition. Should a foreman need any additional material to complete the job, a similar procedure is followed. The cost of materials withdrawn is not charged to the job until completion, at which time the foreman turns in a report of the materials used. After the report is turned in, the foreman's card is credited for the amount reported and the job charged. The details of this report are discussed in Chapter 13.

It is usually necessary, also, to provide maintenance crews with equipment and materials. Such issues should be charged to the foreman of each crew, and as materials are used, he should fill out a requisition, a separate one being filled out for each job. When he turns these in, his stock is replenished by the amount of materials used, as evidenced by the requisitions. Presentation of the requisitions to the storekeeper should take place at the end of each day so that materials may be ready for the maintenance crews the next morning. The requisitions turned in are transmitted by the storekeeper to the stores office, where they are used as the basis for crediting the individual stock cards and charging the individual jobs or accounts affected.

Thus far the discussion has been concerned with materials and supplies issued from the general storeroom. As indicated previously, however, it may be necessary to maintain substorerooms. With these extra care must be taken in accounting

FIGURE 57

MATERIALS RETURN TICKET

No.....................

Date.....................

The items listed below were returned to stores in good condition

except as indicated, and are to be credited to WORK ORDER / ACCOUNT

No...............

POSTED { Inventory Record...............
Materials Issued Register
....

Quantity	Unit	Description	Unit Price	Amount
			TOTAL	

Returned by

....

Received the above material

....
Storekeeper

for the materials withdrawn since there will usually not be any one person devoting his full time to taking care of such stores. As stated before, all receipts by such storerooms must be reported to the stores office, where such receipts are entered on stock cards. A daily record should be kept of the materials used, each pumping station, for example, keeping a record of the daily use of coal, oil, grease, etc. These records should be submitted either weekly or monthly to the stores office, where they serve as the basis for crediting the stock cards and for charging the proper accounts.

All transfers of materials between jobs should be reported to the stores office, and no material should be transferred without authorization of a proper official. The form to be used for this purpose is similar to that for withdrawals (Figure 56). In addition, the job from which the material is transferred and the job to which it is being transferred should be indicated. Where the material withdrawn has been charged to a foreman, the transfer slips are used to credit the foreman transferring material and to charge the foreman receiving same. Where materials are charged to the accounts or jobs as withdrawn, the transfer slips are used as the basis for crediting such accounts or jobs and charging those to which transferred.

Materials and supplies should be returned to the stockroom on a Materials Return Ticket (Figure 57). This ticket should be made out in duplicate, one copy being retained by the storekeeper and transmitted to the stores office, the other going to the department returning the materials. Unless materials have become damaged, they should be recorded on the stock cards as receipts. The stores office will use its copy of the Materials Return Ticket for recording on each stock card, as a receipt, the amount returned. If materials are damaged, a notation to that effect is made on the stock card, or a special card is made out for them. Damaged material should be kept separate from regular stock until a decision is reached as to what disposition is to be made of such material.

If materials are returned to the vendor after they have been recorded on stock cards, a purchase return ticket should be made out in quadruplicate. This ticket would be somewhat similar in form to the Materials Return Ticket (Figure 57). One copy should be retained by the stores office, a second should

be transmitted to the purchasing department, a third to the vendor, and a fourth to the accounting department. The stores office will use its copy for making the proper adjustments on the stock cards, and the accounting department will use its copy both as a basis for preparing a debit memo to be transmitted to the vendor and for crediting the Materials and Supplies account in the General Ledger.

The storekeeper frequently acts as custodian of small tools. In the event that he does, he should not permit the withdrawal of any tools except upon a requisition signed by a duly authorized person. As far as practicable, employees should be required to turn in worn-out tools before new ones are issued. The requisition should be held on file until tools are returned or accounted for properly. If sets of tools are maintained in roving trucks, the latter should be checked from time to time, and a separate card should be prepared for each type of tool in each truck or on any large construction job. A Tool Record card is illustrated in Figure 58. The card itself is self-explanatory, but one important point should be noted—that provision is made for the signatures of both the storekeeper and the person receiving the tools.

Merchandise for resale should also be handled through the central storeroom, a stock card being maintained for each item in the same manner as for materials used in operation. The method of issuing merchandise should also be the same as for materials. There are, however, few water utilities handling merchandise, and even these usually carry only a few items.

The method of recording the withdrawal and use of gas and oil consumed in the operation of equipment is discussed in detail in Chapter 12.

Charging Materials and Supplies to Jobs and Accounts

The procedure to follow in charging each job with the cost of materials used is described in detail in the chapter dealing with cost accounting (Chapter 13). In this chapter, therefore, indication will be made only of how charges for materials are accumulated and recorded in the general books.

A distinction was made above between two types of procedures for recording the issuance of materials. Under one procedure, materials are charged directly to jobs when issued;

FIGURE 58

TOOL RECORD

Name of Tool.. Truck or Job No...............

Size and Type..

Date	Issued	Lost	Broken	Ret'd.	Balance	Date	Issued	Lost	Broken	Ret'd.	Balance

Date	Issued By	Received By	Date	Returned To

under the other, they are charged to the foreman withdrawing them and are not allocated to the job until the latter is completed and the exact amount used determined.

All requisitions which are chargeable directly to jobs are commonly priced as soon as issued and entered in a Materials Issued Register. Provision is made on this register for showing the cost of materials issued plus any overhead charges allocable to materials, such as expenses of stores office. Materials issued for a job and not all used, should, as indicated before, be returned to stock on a Materials Return Ticket (Figure 57). These tickets should be entered in red ink in theMaterials Issued Register immediately above the line showing the issue of materials for the particular job. At the end of the month the register is totaled, and the totals are used as the basis for entries to the General Journal, as described in the last part of this chapter. A form for a Materials Issued Register is illustrated in Figure 59.

An alternative procedure is not to record issues until the end of the month, at which time requisitions and return slips are sorted by work order, and account numbers and totals only are recorded in the Materials Issued Register. In such a case, the Materials Issued Register, illustrated in Figure 59, would be changed by eliminating the "Date" and "Materials Requisition No." and by shifting the position of the "Work Order No." and the "Account No." columns so that they would be the first and second columns respectively.

Where materials are first charged to a foreman, the Materials and Supplies account in the General Ledger is not affected until the job is completed. At that time, the foreman submits a report showing the total material used. These materials are then priced, and, to arrive at the cost of materials used, the proper proportion of overhead expense connected with the handling of materials is added. A separate report is prepared for each job, as illustrated in Figure 89, and on the basis of the totals shown in this report an entry is made charging the Construction Work in Progress account and crediting the Materials and Supplies account.

The cost of materials and supplies used in pumping stations and other field units is determined on the basis of reports submitted by such units. A form for such report is illustrated in

FIGURE 59

MATERIALS ISSUED REGISTER

Date	Material Requisition No.	Materials and Supplies *Credit*	Stores Expenses—Clearing *Credit*	Work Order No.	Account No.	Utility Plant in Service *Debit*	Construction Work in Progress *Debit*	Retirement Work in Progress *Debit*	Other Work in Progress *Debit*	Operating Expenses *Debit*
		131	903			100.1	100.3	144	145	502

Figure 60. The total amount of each type of material and supply used during the month is priced, and the proper entry is made in the General Journal.

It is assumed that materials issued will be priced at cost. The stock card provides space for the unit cost of the material recorded on the card, and the accounting department should notify the stores office of the unit cost to be entered for each type of material. The unit cost is arrived at after taking into consideration not only the cost of materials but also all costs directly applicable thereto, such, for example, as freight in. Overhead expenses, such as the cost of operating the storeroom and stores office, should be set up in a separate account (Stores Expense—Clearing) and a proper proportion thereof applied to materials as issued. Thus the cost of materials issued is arrived at by multiplying the number of units of the material withdrawn, by the unit cost price and by the figure representing the overhead charge per unit. For a detailed discussion of the distribution of stores expenses, see pages 227–229.

Since various shipments of materials may have been purchased at different prices, it would be practically impossible to identify the materials used from any one shipment. Furthermore, no useful purpose would be served thereby. Accordingly, it is advisable either to assume that the materials first purchased are those first used and to apply the unit cost figures on that basis, or to use an average cost price.

In pricing requisitions under the first method, reference is had to the cost of the goods of the earliest purchase still on hand. For example, assume that the cost of 10,000 units purchased on January 15 is $10,000, or $1.00 per unit; that the cost of 5,000 units purchased on February 1 is $7,500, or $1.50 per unit; and that the cost of 10,000 units purchased on February 15 is $8,500, or 85 cents per unit. Assume further that on February 20 there were 16,000 units on hand and that on that date 7,000 units were requisitioned. The cost of the requisitioned material would, under this method, be determined as follows:

1,000 units @ $1.00 = $1,000. (There were 16,000 units on hand. Adding the purchases of February 1 and 20, we have 15,000 units, which means that 1,000 units of the material purchased on January 15 were withdrawn.)

5,000 units @ \$1.50 = \$7,500. (The next purchase was made on February 1, and the entire 5,000 units purchased on that date are assumed to be utilized.)

1,000 units @ \$0.85 = \$850. (The total amount used was 7,000 units so that 1,000 units came out of the last purchase.)

As indicated before, an alternative method is to use a weighted average cost figure. Under this method, a new average cost is calculated every time materials are purchased. The procedure is as follows: The total cost of the materials on hand is arrived at by pricing them at the average cost figure. To this cost is added the cost of materials purchased. The total cost thus arrived at, is, in order to arrive at the new average cost per unit, then divided by the total number of units on hand and purchased. To illustrate, assume that on October 10, there were on hand 100,000 units each costing \$1.00, and that there were received on this day 10,000 units, each costing \$1.05. The average cost would be \$1.0045, arrived at as follows:

On hand..................	100,000 units	@ \$1.00 =	\$100,000
Purchased	10,000 units	@ \$1.05 =	10,500
Total	110,000 units	@ \$1.0045 =	\$110,500

This average would be used for pricing requisitions until a new shipment was received, at which time a new average price would be arrived at by following a procedure identical to the one illustrated above. This method requires considerable computation and is more practicable for large than small utilities.

Inventories

While the system described in this chapter makes it possible to know at all times the amount and cost of materials on hand, it is necessary to supplement the records with an actual physical count. Such count may be made only at the end of the fiscal year or at more frequent intervals, a separate section being inventoried at a time in the latter instance. Regardless of the frequency with which inventories are taken, however, the following suggestions should prove helpful.

The first is to arrange the materials so as to facilitate inventory taking. This includes bringing out material from inaccessible places and arranging it so that it can be easily

FIGURE 60

REPORT OF DAILY USE OF MATERIALS AND SUPPLIES AT

_____________Station

For Month Ending_______________

Date	Coal (Tons)	Oil (Quarts)	Grease (Pounds)
TOTAL			
Cost per Unit Stores Expenses per Unit			
TOTAL UNIT COST			
TOTAL COST			

counted. Obsolete materials should be separated from those in good condition.

Tags should be attached to the bins and to each pile of material not stored in a bin. The tag (Figure 61) should provide space for filling in the following information: name of article, date of inspection, quantities examined, and initials of employees doing the work. Each tag will be in two sections, and the lower part, which will bear the same number and information as the upper part of the tag, should be perforated so that it may be

FIGURE 61

INVENTORY TAG

No.................

Item No.......................Date..................................

Name..

Description...

Unit.................................Size.....................................

Count By...

Checked By...

Physical Count	In	Out

- -

Detachable Stub

No.................

Item No.......................Date..................................

Name..

Description...

Unit.................................Size.....................................

Count By...

Checked By...

Physical Count...

detached as soon as the inventory is taken. As materials are counted, the tags and stubs are filled out, and the latter are detached and transmitted to the accounting department. The tags are left attached to bins or to piles of materials, pending the completion of inventory calculation. Any additions to stock, or removals therefrom, prior to the removal of the tags, should be noted on the appropriate tags.

The use of detachable stubs is not absolutely necessary but is helpful in insuring proper taking of the inventory. It is possible to leave the tags on the bins, or attached to the material, for a period of time without fear that they will be altered. Moreover, it is highly desirable to leave the tags on for a short period of time so that an inspection may be made to see that no group of items is left uncounted. Such tags also facilitate the rechecking of items when it is discovered that they are too much out of line with the amount shown by the stock cards. In some cases, an independent inventory tabulation is made from the tags, and the inventory thus calculated is checked against the tabulations made from the detachable stubs.

After the person in charge of the inventory has assured himself that all the material has been counted and all the stubs have been turned in, the stubs should be sorted in the order in which the stock cards are carried. Inventory sheets should be prepared at some time before the actual taking of the inventory. These (Figure 62) should provide space for showing the following information: tag number, item number, name of article, unit, quantities per stock records, quantities disclosed by actual count, difference, unit cost price, and total cost. The amount shown by each stub should be entered in the "Physical Count" column, data for the "Stock Card" column being entered from the stock cards. The differences between the amounts shown in the two columns are recorded in the "Difference" column.

Differences between the amount shown on the stock cards and that revealed by the physical count, should be carefully investigated. Such differences may arise through shrinkage and breakage, through neglect to record materials issued, or through theft. After the differences have been investigated, the stock cards should be adjusted to correspond to the quantities revealed by the physical inventory.

It is assumed that inventories will be valued at cost since

FIGURE 62

INVENTORY SHEET

Sheet No.................................

Priced By.................................. Extended By.................................. Date.................................

Approved By.................................. Date of Inventory.................................

Tag Number	Item Number	Description	Unit	Quantity			Unit Price	Total Cost
				Per Stock Card	Per Physical Count	Differ-ence		

the materials are to be used for the most part in actual operations and not held for resale.

Entries

The entries shown below illustrate (1) the method of recording overhead charges allocable to materials, (2) the method of charging and crediting the proper general ledger accounts and subsidiary accounts with the cost of materials issued and used, and (3) the entries to be made in adjusting the stock records to correspond with physical inventories.

1. *Stores Expenses—Clearing.* All overhead charges connected with the handling of goods should be recorded in a Stores Expenses—Clearing account. The entries are illustrated in Chapter 12.

2. *Charging and Crediting Accounts with Materials Used.* Mention was previously made of three media whereby costs of materials are accumulated, namely, the Materials Issued Register (Figure 59), reports of materials used on completed jobs (Figure 89), and reports of daily use of materials drawn from sub-storerooms (Figure 60). The following entry is made to charge and credit the proper control accounts with the cost of materials issued and used:

Construction Work in Progress (100.3)........	$5,000	
Other Work in Progress (145).............	1,000	
Operating Expenses (502)....................	2,000	
Materials and Supplies (131)..............		$7,700
Stores Expenses—Clearing (903)...........		300
An entry in the General Journal to record cost of materials used, as indicated by Materials Issued Register, or reports of materials issued from sub-storerooms, and summary of materials used on completed jobs (but in the latter case the Operating Expenses account would probably not be involved).		

The supporting accounts for the Construction Work in Progress (100.3) and Other Work in Progress (145) accounts will be the individual work orders to which postings will have been made from the same reports. The Operating Expenses account (502) will be supported by detailed operating expense accounts, postings to which will also have been made from the first and third reports mentioned above.

3. *Adjusting Inventory.* The entries to record the adjustment of the book inventory to the physical inventory will vary with the conditions giving rise to the difference. Assuming that the difference arose because of neglect to record materials issued, an entry must be made charging the proper account and crediting the Materials and Supplies account. This entry, assuming the cost of materials is to be charged to an operating expense account, would be as follows:

Operating Expenses (502)	$100	
Materials and Supplies (131)..................		$100

An entry in the General Journal to record materials and supplies used in connection with purification and not recorded.

Postings would also be made to the subsidiary expense account affected and an adjustment made on the proper stock cards.

If, on the other hand, the reason for the difference is not known, or if the difference arose because of shrinkage, it might be prorated among the activities in connection with which the material is used. Assuming only operating expense accounts are involved, the entry would be similar to the foregoing except that a greater number of subsidiary operating expense accounts would be affected. In cases affecting fixed asset accounts, the entry would be a debit to Construction Work in Progress (100.3) or Other Work in Progress (145) or both, and a credit to Materials and Supplies (131). The individual work orders would be charged with the cost of such shrinkage, and each stock card would be adjusted for the shortage.

Where it is impracticable to allocate the difference, the amount might be charged to Stores Expenses—Clearing (902), the entry being as follows:

Stores Expenses—Clearing (902)................	$100	
Materials and Supplies (131)..................		$100

An entry in the general journal to record charging Stores Expenses—Clearing account with differences between inventory, as shown by records and as disclosed by a physical count. SUBSIDIARY ACCOUNTS: *Debit* Other Stores Expenses (902.6). In addition, an entry would be made on the proper stock card in order to reflect the reduction in the particular material.

Chapter 9

PAYROLL ACCOUNTING

Steps in Payroll Accounting

The steps involved in accounting for payrolls are as follows:

1. Notifying the accounting office of additions to payroll
2. Providing for a daily record of time put in
3. Charging particular jobs with cost of labor
4. Determining the amount to be paid each individual at the end of a pay period
5. Charging the proper expense accounts with salary and wage expenses
6. Making payment

Chart VII illustrates the various steps involved in accounting for payrolls and also the documents and records to be used in that connection.

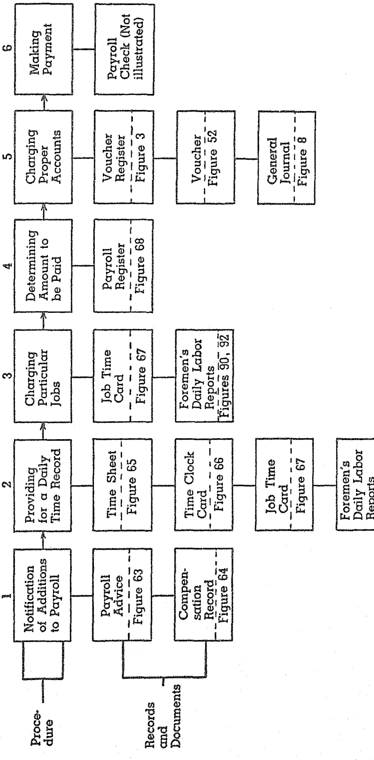
Notification of Additions to Payroll or of Removals Therefrom

As soon as an employee is hired, the payroll division, or if no special payroll division exists, the general accounting department, should be notified. Similarly, the payroll division or accounting department should be notified of removals from the payroll and of changes in the status of employees. These notifications will serve as the basis for making any necessary adjustments or for adding names to, or removing names from, the payroll. A form suitable for notification purposes is illustrated in Figure 63.

In the case of private utilities, because of information returns on employees' earnings to be filed with the Commissioner of Internal Revenue, and because of payments under the Social Security Act, it is essential that a record be set up for each employee, showing his earnings for each pay period (Figure 64). This card should be kept up to date, the entries thereto being made by a payroll clerk as soon as the payroll is completed and the analysis for the distribution of expenditures made.

CHART VII

PROCEDURE AND RECORDS AND DOCUMENTS IN ACCOUNTING FOR PAYROLLS



Timekeeping

The next step is securing the amount of time put in by each employee. Time must be so kept that information will be available to indicate not only the amount of pay due the employee but also the basis on which labor expenses may be allocated to

FIGURE 63

PAYROLL ADVICE

Payroll Office: Date..

Please correct your records by adding the name of / removing the name of / changing the status of

....

Dept............................ No.............................. Rate.............................

Explanation..

....

This notice is effective.............................. A.M. / P.M. ....193....

Entered on Payroll...................... Recommended by........................

Personnel Information..

Personal Earnings Record...................... Approved by........................

various operations and jobs. The method of timekeeping will vary with the type of work involved and conditions under which the work is carried on.

In all instances where work is carried on in one place at all times, as for example, in a pumping station, either of two methods of keeping time may be used. One is to set up sheets on which employees sign in when arriving for work in the morning and sign out when leaving at night. These sheets are put out by the timekeeper in the morning, are taken in as soon as work begins, and are put out again at night before employees leave. A separate sheet is provided each day. A form for such sheet is illustrated in Figure 65.

FIGURE 64

INDIVIDUAL COMPENSATION RECORD

Name.. Social Security No. ....

Address.. Department..

Calendar Year..

Date	Hours	Amount Paid	Social Security Tax	Date	Hours	Amount Paid	Social Security Tax	Date	Hours	Amount Paid	Social Security Tax

FIGURE 65

TIME SHEET

Department____________________ Date____________

Payroll No.	In (Time)	Name (Signature)	Out (Time)	Name (Signature)	No. of Hours Worked

Another and preferable method is to use a time clock. In this case, each employee is provided with a card on which is sufficient space to record daily, for the duration of the pay period, the attendance of the employee. As is indicated on the time card illustrated in Figure 66, employees are usually required to punch the clock four times a day: in the morning, before and after the lunch period, and at the end of the working day. Sometimes, when working overtime, they are also required to punch the clock at the inception and end of overtime work.

If all the work carried on under the circumstances described above is chargeable to one expense account—as, for example, pumping labor—no further records are needed. Where, however, the cost of labor of individual workmen is to be charged to particular jobs or allocated among several expense accounts, additional time tickets should be provided, on which will be indicated the amount of time worked by the employees on each particular job. Each employee should be supplied with such a card at the beginning of each working day; and as he begins to work on a particular job, the time at which work is commenced should either be written in or recorded on the clock, the same operation being repeated when work on the job is completed. At the end of the day the cards should be turned over to the foreman, who should "O.K." and transmit them to the cost ac-

FIGURE 66

TIME CLOCK CARD

Name ____________________ No. ________

Week Ending ____________________ 193____

	A.M.		P.M.		OVERTIME	
	In	Out	In	Out	In	Out
Sunday						
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						

FIGURE 67

JOB TIME CARD

Name ____________________ No. ____

Date ____________ Rate per Hour ________

Charge Time to	TIME		Amount
	Hrs.	Min.	
Overhead Time			
TOTAL			

counting office. A form for such a card is illustrated in Figure 67. Where these cards are used, the time clock card (Figure 66) is frequently dispensed with.

In the case of employees working on construction jobs, the time may be kept by a timekeeper or by the foreman. The forms to be used are illustrated in Figures 90 and 92.

Calculating Amount Due Each Employee

The time for each employee having been recorded, the next step is to determine the amount of pay. This is the work of the payroll division, or, if none exists, of the general accounting department. The amount due each employee, as well as all the detailed information on the basis of which the amount due is calculated, should be recorded on a Payroll Register (Figure 68). The latter should usually be prepared at the beginning of the pay period, at which time the sheets will contain only information as to employee's name and any other data, such as clock number or some special payroll identification number, which will help in identifying him. In the case of municipal utilities, the sheets may also contain the budget code number; and in the case of private utilities, they should contain the social security number. The rate of pay will also be filled in at this time.

Larger utilities will find it economical to have addressing machine plates, bearing all of this information, prepared as soon as an employee is hired. At the beginning of each pay period, payroll sheets should be run off on these plates, additions to the payroll, or removals therefrom, being made as notifications are received.

Usually it will be found advisable to prepare separate payrolls for different groups of employees. Thus, for example, it may be desirable to prepare separate payrolls for employees engaged in construction work, for service maintenance crews, for office employees, etc. To even out the work of the payroll division of a large utility, pay periods for different departments may be staggered and separate payrolls prepared for each. In a small utility such separation may not be necessary.

The first step in determining the amount of pay due each employee is to arrive at the amount of time put in. Time sheets, time clock cards, or field reports, will form the basis for obtaining this information. In this connection, however, a distinction

FIGURE 68

PAYROLL REGISTER

Period Ending ________ Division ________

No.	Social Security Number	Name	S	M	T	W	T	F	S	Days Worked	Hours Worked	Rate	Amount	Deductions			Net	Check Number
														Social Security Taxes	Pensions	Others		

must be made between salaries which are chargeable to different jobs and those which are not. In the case of the former, as indicated before, job time cards and foremen's reports are transmitted daily to the cost accounting office, if one exists—otherwise, to the accounting department. Here the rates per hour and the total pay for the day for each man, as well as the amount of labor chargeable to each job, are arrived at. After each job has been charged with the cost of labor applicable to it, the job time cards and foremen's reports are transmitted to the payroll division, if one exists; otherwise, to the person in the accounting department who is in charge of payrolls.

It was assumed above that employees working on different jobs within the plant were required, in addition to filling out job time cards, to punch the clock every morning, noon, and evening. The amount of pay can, in their case, therefore, be secured from two sources: (1) from the job time cards, which have already been computed in the cost accounting office, or (2) from the time cards or time sheets showing total number of hours worked each day. In order to secure some proof that the calculations made by the cost accounting office are correct, and also to make sure that idle time, such as that elapsing between the finishing of one job and commencing of another, is taken into account, the number of hours worked each day should be entered from the time cards or time sheets and the total pay arrived at by multiplying the total number of hours worked during the period by the rate per hour. The number of hours would, in this event, not be entered until the end of the pay period when the time card for each worker was received. The cost accounting office would, after charging each job with the cost of labor, transmit job time tickets to the payroll department or general accounting office daily, where the tickets would cumulate until the end of the payroll period. The tickets would, however, serve merely as a check and would not be used directly in compiling the payroll.

An alternative to the above method is to enter earnings on the payroll sheet as soon as the job time tickets are received. In this event, too, the tickets would be held until the end of the payroll period, at which time the total time for each employee, as shown by the time card, would be multiplied by the rate per hour, the result being checked against the payroll sheet.

A third plan is to record daily on the payroll sheet both the number of hours worked and the amount earned by each employee.

Where the nature of the work does not require the filling out of a job time ticket, the time sheets or time cards form the only basis for calculating the payroll. For employees paid on an hourly basis, either the total number of hours worked for the pay period, or the number worked each day, may be entered as one figure. The payroll for employees paid on a weekly, semi-monthly, or monthly, basis is usually prepared separately from that for those paid on an hourly basis, the number of days absent, rather than the number of days worked, being shown on the Payroll Register.

The amount of pay for each laborer paid on an hourly basis is arrived at by multiplying the number of hours worked by the rate per hour. For employees receiving a flat salary, the amount of pay is arrived at by multiplying the number of days absent by the rate per day and deducting the resulting product from the fixed salary for the period. Before making deductions for absences, however, care must be taken to note that such absences do not fall within the number allowed the employee without deduction of pay.

The preparation of the payroll also involves deducting the proper amount from each employee's pay for his portion of social security tax payable and for pension contributions. The amount arrived at after making these deductions constitutes the amount to be paid to the employee.

After the payroll has been prepared, it should be audited. This function should be performed by persons other than those having anything to do with the preparation of the payroll. The audit consists of ascertaining that extensions and footings are correct and that the rates, number of hours, and other similar information have been properly recorded. Where payment is based on an hourly rate, proof may be secured by multiplying each rate by the number of hours applicable to it and adding together the products; the total should equal the gross amount shown by the time sheet. The net amount payable can be proved by subtracting total deductions from the gross amount payable. Where the cost has been allocated to particular jobs, the total of labor costs charged to such jobs should be checked to see if

it agrees with the total amount shown as due the employees working on these jobs. In the case of municipal utilities, the city's budget officer must approve the payroll as to conformity with the provisions of the budget and the rates of pay set up therein. Confirmation by the city civil service commission for civil service employees may also be essential.

Making Payment

After the payroll has been audited and approved, a voucher should be made out on which the expenditures will be distributed among the various accounts affected. The basis for the distribution will be the payroll sheets and the time sheets, time cards, job cards, and field labor reports. A check should then be issued for the total amount of the payroll. At this point the procedure varies according to whether employees are paid by check or in cash. If payment is to be made by check, the payroll check should be deposited in a special payroll account in the bank; against this account the individual payroll checks would be drawn. It should be noted, however, that where the individual payroll checks are numerous, they should be prepared as soon as the payroll has been pre-audited and approved, which may even be before the check covering the total payroll is prepared. Where payment is to be made in cash, the check would be cashed and currency obtained in the proper denominations.

The distribution of checks should be made by a paymaster and, if possible, in the presence of the head of each department. Such a precaution will tend to eliminate the opportunity for payroll padding, excepting that which is accomplished through collusion. When it is impossible to deliver a check to the person whose name is on it, the reason should be ascertained and the check either retained by the paymaster or left for a short period of time with the head of the department; a record thereof is made by the paymaster. Under no circumstances should the head of any department, or any other individual, be permitted to make repeated deliveries to the same person without occasional test checks.

If employees are paid in cash, each employee's pay should be placed in an envelope on which should be indicated his total pay for the period, deductions, and the net amount in the

envelope. Each employee should be required to sign for his pay, and unclaimed pay envelopes should be returned to the payroll division, where they should be held for a short period of time. Employees who have not claimed their envelopes would have to call for their pay at this office. Sometimes, in cases where the employee is not present on pay-day but is expected to return within a day or two, provision is made for leaving the envelopes for a day or two with the foreman. In that case, the foreman gives a receipt for the total money turned over to him and, in turn, secures from employees, as they receive the envelopes containing their pay, receipts which he transmits to the payroll division.

Since it may take several days to make up the payroll, the regular pay date should be set with this in mind. Payroll information is not available from the different departments until the day after the end of the pay period. Therefore, enough time should be allowed after the end of the pay period to permit the preparation of the payroll summary, the pre-auditing of the payroll, and the actual writing and signing of the payroll checks. The size of the utility and the number of employees on each payroll will determine the length of the period which should intervene between the end of the pay period and the date of payment.

Entries

The first entry affecting the general ledger accounts is made in the Voucher Register as soon as the voucher covering the payroll is approved. The entry is as follows:

Operating Expenses (502)	$34,800	
Construction Work in Progress (100.3)	8,000	
Retirement Work in Progress (144)	1,100	
Vouchers Payable (222)		$43,900

An entry in the Voucher Register to record authorization of payroll, as follows:

Operating Expenses:	
Source of Supply	
Operation Supervision and Engineering (701)	$ 500
Operation Labor (702)	5,000
Maintenance Supervision and Engineering (704)	500
Maintenance of Reservoirs (705.1)	1,000
Total	$ 7,000

Power and Pumping	
Operation Supervision and Engineering (721)	$ 500
Power Production Labor (722.1)	3,000
Pumping Labor (722.2)	1,000
Maintenance Supervision and Engineering (725)	500
Maintenance of Structures and Improvements (726)	1,000
Total	$ 6,000
Purification	
Operation Supervision and Engineering (741)	$ 400
Purification Labor (742)	3,000
Etc.	3,000
Total	$ 6,400
Transmission and Distribution	
Operation Supervision and Engineering (751)	$ 600
Maps and Records (752.1)	1,000
Etc.	8,400
Total	$10,000
Customers' Accounting and Collecting	
Supervision (780)	$ 500
Customers' Contracts and Orders (781.1)	500
Etc.	1,000
Total	$ 2,000
Sales Promotion	
Sales Salaries and Expenses (786)	$ 400
Administrative and General Expenses	
Salaries of General Officers and Executives (790) ...	$ 1,000
Other General Office Salaries (791)	1,000
Etc.	1,000
Total	$ 3,000
Total Operating Expenses.......................	$34,800

Construction Work in Progress:

Work Order No.	*Amount*
2145	$ 500
2146	800
2147	700
2148	2,000
2149	3,000
2150	1,000
Total	$8,000

Retirement Work in Progress:

Retirement Order No.	*Amount*
210	$ 200
211	100
212	100
213	400
214	300
Total	$1,100

In accordance with the assumption previously made, postings to the individual operating expense subsidiary accounts would be made directly from the voucher. Although work orders and retirement orders are listed individually above, postings thereto would usually be made from foremen's daily time reports and job time cards. The same also applies to some of the operating expense accounts listed above.

When payment is made, the entry is:

Vouchers Payable (222)	\$43,900	
Cash (120)		\$43,900

An entry in the Check Register to record payment of salaries and wages.

Indication was made before that a special payroll account may be established, against which payroll checks will be drawn. To this method of payment the above entry is also applicable, a memorandum account being kept showing the amount deposited in the payroll account. Theoretically, however, such cash does not belong to the utility, and the account will, therefore, not appear on any statement. A reconciliation should be made at the end of each month between the balance to the credit of the payroll bank account as reported by the bank, and as indicated by the records. Usually the main difference will arise out of the fact that some of the payroll checks have not cleared. The procedure in making a bank reconciliation is outlined in detail on pages 298–300.

When an employee has left the employ of the utility and his payroll check has not cleared for two or three months, it may be advisable to credit the amount involved to a special account, the entry being:

Cash (120)	\$300	
Reserve for Unclaimed Wages (258)		\$300

An entry in the Cash Receipts Register to record unclaimed payroll checks.

Several deductions may be made before arriving at the net amount due each employee. For purposes of illustration, assume that in private utilities deductions for social security taxes are made from salaries and wages, whereas in municipal utilities deductions are made for pension contributions. It must be re-

membered that contributions by the employer are not considered here, the employer, in this case, acting merely as a collecting agent. Assume, also, that of the total amount for which the voucher is prepared, $2,000 represents deductions for contributions to a pension fund (or deductions for social security taxes of the same amount in the case of private utilities). In such an event, two entries would be made at the time wages and salaries were paid. The first would be to cover the actual payments to employees and would be somewhat as follows:

Vouchers Payable (222)	$41,900	
Cash (120)		$41,900
An entry in the Check Register to record payment of salaries and wages.		

The preparation of a voucher for the total amount of the payroll is necessary in order that the expenditures may be distributed to the proper accounts by one entry. Since the above entry took care of only part of the liability, it is necessary to show the liability to the parties to whom the money is to be paid over. This is accomplished by the following entry:

Vouchers Payable (222)	$2,000	
Due to Pension Fund (232.1)		
or		
(Taxes Accrued) (228)		$2,000
An entry in the General Journal to indicate the liability on account of deductions from employees' salaries and wages for pension fund contributions (or social security tax payments).		

An alternative procedure is to record both the liability on account of payroll and the distribution of payroll expenses by means of a general journal entry. The entry would be as follows:

Operating Expenses (502)	$34,800	
Construction Work in Progress (100.3)	8,000	
Retirement Work in Progress (144)	1,100	
Accrued Payroll (233)		$41,900
Due to Pension Fund (232.1)		
or		
(Taxes Accrued) (228)		2,000
An entry in the General Journal to record authorization of payroll as follows:		

(The remaining part of the explanation would be similar to that illustrated in the first entry of this chapter on pages 193–194.)

A voucher would then be made out for the amount of the payroll, the entry being:

Accrued Payroll (233)	$41,900	
Vouchers Payable (222)..................		$41,900

An entry in the Voucher Register to record authorization to make payment.

The remaining entries are similar to those illustrated under the first procedure. In the case of both municipal utility pensions and social security taxes, the employer is required to contribute in part, his contribution being distributed, if practicable, among the various expense accounts. The entry would be:

Operating Expenses (502)...................	$2,000	
Construction Work in Progress (100.3)........	450	
Retirement Work in Progress (144)...........	50	
Due to Pension Fund (232.1)		
or		
(Taxes Accrued) (228)...................		$2,500

An entry in the General Journal to record the utility's liability on account of contributions to be made by it to pension fund (or utility's liability for social security taxes), to be distributed among the various expense accounts as follows:

(The remaining part of this explanation would be similar to that illustrated in the first entry of this chapter on pages 193–194.)

Assume that it is impracticable to spread such taxes or pension payments over the various expense accounts. The entry would, in that case, be:

Operating Expenses (502)...................	$2,500	
or		
(Taxes) (507)		
Due to Pension Fund (232.1)		$2,500
or		
(Taxes Accrued) (228)		

An entry in the General Journal to record the utility's liability on account of pension contributions (or social security taxes). In the case of pension payments, posting would also be made to the subsidiary account, Pensions (800.2).

In either case, that is, regardless of whether such payments are distributed among the expense accounts or not, the entries for the payment of the liability will be:

Due to Pension Fund (232.1)	$2,500	
or		
(Taxes Accrued) (228)		
Vouchers Payable (222)....................		$2,500
An entry in the Voucher Register to record authorization for payment of contribution to pension fund (or social security taxes).		
Vouchers Payable (222)......................	$2,500	
Cash (120)...............................		$2,500
An entry in the Check Register to record payment of voucher.		

In the case of both pensions and social security taxes, the utility will usually pay over its own contribution at the time it transmits the amount deducted from the employees' salaries. Assuming that the deductions and the amount contributed by the utility are as indicated above, the entry will be:

Due to Pension Fund (232.1)	$4,500	
or		
(Taxes Accrued) (228)		
Vouchers Payable (222)....................		$4,500
An entry in the Voucher Register to record authorization for payment of amounts deducted by the utility from employees' salaries and wages and contributions by the utility.		
Vouchers Payable (222)......................	$4,500	
Cash (120)...............................		$4,500
An entry in the Check Register to record payment of voucher.		

Thus far it was assumed that the utility paid over the pensions collected to some outside party such, for example, as a pension board. Sometimes the utility itself is entrusted with the custody of such funds. In that case the entries up to the point of payment would be the same as those illustrated above. Instead of recording the payment of money, however, an entry would be made indicating the segregation of cash to be used in paying pensions. The entry assuming a separate bank account is set up would be:

Pension Fund (114)........................	$4,500	
Vouchers Payable (222)....................		$4,500

An entry in the Voucher Register to record authorization to contribute to pension fund. SUBSIDIARY ACCOUNTS: *Debit* Pension Fund Cash (114.1), $4,500.

Vouchers Payable (222).....................	$4,500	
Cash (120)................................		$4,500

An entry in the Check Register to record payment of voucher.

CHAPTER 10

ACCOUNTING FOR CONTRACTUAL SERVICES, INTEREST ON NOTES, AND TAXES

Introduction

This chapter is concerned with expenditures incurred for services rendered by outsiders (which may involve either materials or labor or both), with interest on short term indebtedness, and with taxes. Interest and taxes are frequently referred to as fixed charges because they are not related directly to the volume of operation. Some of the expenditures included in the first group—as, for example, rent and insurance—might also be classified as fixed charges. Depreciation, although a fixed charge, is, because of its importance, treated in a separate chapter. Interest on long term debt is treated in Chapter 18, which deals in part with long term debt.

The following are some of the expenditures usually classified as contractual expenditures:

1. Construction by Contract
2. Rent
3. Insurance
4. Transportation Charges (for transportation services rendered by outside agencies)
5. Laboratory Testing (where performed by outside agency)
6. Telephone and Telegraph
7. Postage

The accounting procedure for each of these is discussed in detail below.

Construction by Contract

Contractors may not be paid until construction is completed, although usually advances are made from time to time as the work progresses. When an advance on the contract is made, the entry is:

Construction Work in Progress (100.3)......	$10,000	
Vouchers Payable (222).................		$10,000

An entry in the Voucher Register to record the authorization of advance on contract.

Vouchers Payable (222)....................	$10,000	
Cash (120).............................		$10,000

An entry in the Check Register to record payment of a voucher.

At the end of the year, an entry should be made setting up the difference between total estimated work in progress and work in progress carried on the records. The entry is:

Construction Work in Progress (100.3)........	$5,000	
Contracts Payable (234)..................		$5,000

An entry in the General Journal to record work in progress not yet placed on books.

This entry should be reversed immediately at the beginning of the year, the transaction being recorded as follows:

Contracts Payable (234).....................	$5,000	
Construction Work in Progress (100.3)......		$5,000

An entry in the General Journal to reverse entry made at end of last year.

The reason for reversing the above entry is that the amount represents merely a rough estimate of the cost of work in progress. Actual cost is represented by the payments made. However, even though such amount represents an estimate, it should be set up on the books at the end of the year so that the financial statements may reflect the actual financial condition of the utility. As soon as that purpose is accomplished, that is, as soon as such statements have been prepared, both the estimated value of the asset (Construction Work in Progress) and the estimated liability (Contracts Payable) can be removed from the records. During the following year, as invoices are received from the contractor, the actual asset and the corresponding liability will be recorded.

When the contract is completed and a bill for the final installment on the contract is received, the entry will be:

Construction Work in Progress (100.3)......	$10,000	
Vouchers Payable (222).................		$10,000

An entry in the Voucher Register to record authorization of final payment on contract.

Frequently, a certain percentage of the contract is retained, pending inspection of the project. Assuming that $1,000 is to be retained, the entry will be:

Construction Work in Progress (100.3)........	$10,000	
Vouchers Payable (222)...................		$9,000
Retained Percentage (235)		1,000

An entry in the General Journal to record authorization of payment of part of last installment on construction contract and retention of 5 per cent of total contract, pending inspection and final approval of project.

The payment of the voucher is recorded by the following entry:

Vouchers Payable (222)......................	$9,000	
Cash (120)...............................		$9,000

An entry in the Check Register to record the payment of a voucher.

When the project is finally approved, the entry is:

Retained Percentage (235)	$1,000	
Vouchers Payable (222)...................		$1,000

An entry in the Voucher Register to record authorization to make final payment on construction project.

Payment of the voucher is recorded by the following entry:

Vouchers Payable (222)......................	$1,000	
Cash (120)...............................		$1,000

An entry in the Check Register to record the payment of a voucher.

As soon as the project has been inspected and approved, an entry should be made setting up the fixed asset on the books. Assuming a building to be used for purification purposes is erected, the entry will be:

Utility Plant in Service (100.1)..............	$20,000	
Construction Work in Progress (100.3)....		$20,000

An entry in the General Journal to set up new building to be used for purification of water. SUBSIDIARY ACCOUNTS: *Debit* Purification Buildings (312.3), $20,000.

Rent

Usually a utility will own its operating plant. Even in that case, however, it may be necessary to rent property for diverse purposes. Rentals may be paid on a yearly or monthly basis. If monthly, the entry at the time the rent is paid is as follows:

Operating Expenses (502)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record authorization for the payment of rent. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $500.

Vouchers Payable (222)	$500	
Cash (120)		$500

An entry in the Check Register to record payment of voucher.

If rent is paid a considerable time in advance, the entries to be made at the time of payment are:

Prepaid Rent (132.1)	$5,000	
Vouchers Payable (222)		$5,000

An entry in the Voucher Register to authorize the prepayment of rent.

Vouchers Payable (222)	$5,000	
Cash (120)		$5,000

An entry in the Check Register to record payment of voucher.

As rent becomes due, the Prepaid Rent account is reduced by the amount becoming due, the entry being:

Operating Expenses (502)	$500	
Prepaid Rent (132.1)		$500

An entry in the General Journal to record reduction of the Prepaid Rent account by amount of rent becoming due. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $500.

On the other hand, when rent becomes due and is not paid, an entry should be made as follows:

Operating Expenses (502)	$300	
Accrued Rents Payable (230)		$300

An entry in the General Journal to record rent due but not paid. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $300.

FIGURE 69

INSURANCE REGISTER

YEAR 1938

Issued By	Local Agent	Coverage	Face	Policy No.
Globe Insurance Company	P. Jones	Fire—General Office	15,000	1267081
Casualty Company	E. Smith	Liability—Auto	25–50	2349827
Casualty Company	E. Smith	Bond—Cashier	5,000	M-546397

Continued on next page.

FIGURE 69 (Continued)

Continued from preceding page.

INSURANCE REGISTER

YEAR 1938

Policy Date	Policy Term	Premium	Monthly Expiration	December 31, 1938			
				Unexpired	Expired	Charge to Account	
						Number	Name
6–30–37	3 yrs.	360.00	10.00	180.00	180.00	798	Insurance
9–30–38	1 yr.	495.20	41.27	371.39	123.81	904.6	Other Transportation Expenses
11–30–38	1 yr.	50.00	4.17	45.83	4.17	783	Miscellaneous Expenses
		2,838.26		1,216.34	1,621.92		

Usually, even though the rent has become due before, such entry need not be made until the time statements are prepared.

As far as practicable, rent expenses should be identified with, and charged to, the activity to which applicable. For example, in the above entries, rent expenses have been charged to account 785, one of the subdivisions under Customers' Accounting and Collecting Expenses, on the assumption that rent was paid for space occupied by the customer accounting office.

Insurance

The most common form of insurance met with in the water works field is property insurance. Insurance is paid for in advance, prepayment covering a period of from one to three years. As soon as the policy is received, it should be recorded in an insurance register. Such register should provide space for recording information as to the name and address of the insurance company, kind of insurance, policy number, total premium, period covered, and the amount to be charged each month. For a form of Insurance Register, see Figure 69.

Similarly, as soon as the insurance policy is received, the following entry should be made:

Prepaid Insurance (132.2)	$360	
Vouchers Payable (222)		$360

An entry in the Voucher Register to record issuance of fire insurance policies.

When the premiums are paid, the entry is:

Vouchers Payable (222)	$360	
Cash (120)		$360

An entry in the Check Register to record payment of voucher.

Since insurance premiums are paid in advance and set up as an asset, it is necessary to charge each accounting period with its proportionate share of such expenses. The amount to be charged will be determined by reference to the insurance register, the premium usually being spread equally over the life of the policy. The entry to record the charge to an accounting period will be:

Operating Expenses (502)	$10	
Prepaid Insurance (132.2)		$10

An entry in the General Journal to record insurance expense applicable to the month of December. SUBSIDIARY ACCOUNTS: *Debit* Insurance (798), $10.

Some of the larger utilities carry their own insurance reserves, in which case the following entry is made at the end of each accounting period:

Operating Expenses (502)........................	$10	
Insurance Reserve (255)........................		$10

An entry in the General Journal to charge estimated insurance expense and to increase the insurance reserve by a corresponding amount. SUBSIDIARY ACCOUNTS: *Debit* Insurance (798), $10.

Many utilities carry workmen's compensation insurance. The entries involved are similar to these illustrated above in connection with fire insurance.

Transportation Charges

Indication has already been made of how transportation charges connected with the receipt of merchandise are recorded. (See page 158.) The important point to remember is that such charges should be included as part of the cost of materials. Similarly, the cost of transporting machinery and equipment from the place of purchase to the plant should be recorded as part of the cost of machinery or equipment.

Laboratory Testing

Only charges for tests made by outside laboratories are discussed here. Such tests are sometimes made in connection with materials purchased, in which case these expenses should be considered as part of the materials purchased and charged directly thereto. Sometimes, especially in the small utilities, it may be necessary to have some of the chemical tests performed by an outside laboratory, in which case the expenses should be charged directly to the activity concerned. Assuming, for example, that the testing is performed for the purification division, the entry would be:

Operating Expenses (502)........................	$500	
Vouchers Payable (222)........................		$500

An entry in the Voucher Register to record cost of testing water. SUBSIDIARY ACCOUNTS: *Debit* Purification Supplies and Expenses (743), $500.

When the voucher is paid, the entry would be:

Vouchers Payable (222)	$500	
Cash (120)		$500

An entry in the Check Register to record payment of voucher.

Telephone and Telegraph

Telephone and telegraph bills are usually received monthly. Although telephone bills usually are for services to be rendered in the future rather than for past service, the amount involved is so small that it may be recorded as an expense as soon as paid. The entries to record such expenses are as follows:

Operating Expenses (502)	$50	
Vouchers Payable (222)		$50

An entry in the Voucher Register to record telephone expenses. SUBSIDIARY ACCOUNTS: *Debit* General Office Supplies and Expenses (793), $50.

Operating Expenses (502)	$25	
Vouchers Payable (222)		$25

An entry in the Voucher Register to record telegraph expenses. SUBSIDIARY ACCOUNTS: *Debit* General Office Supplies and Expenses (793), $25.

When the telephone and telegraph bills are paid, the entries are:

Vouchers Payable (222)	$50	
Cash (120)		$50

An entry in the Check Register to record payment of voucher.

Vouchers Payable (222)	$25	
Cash (120)		$25

An entry in the Check Register to record payment of voucher.

Postage

The manner in which postage will be recorded will depend on the size of the utility. In large utilities, especially in those in which bills are sent through the mail, mailing machines are usually employed. In such cases an advance payment is made to the post office, the entry to record the prepayment being as follows:

Prepaid Postage (132.4)	$5,000	
Vouchers Payable (222)		$5,000

An entry in the Voucher Register to record prepayment of postage.

Vouchers Payable (222)	$5,000	
Cash (120)		$5,000

An entry in the Check Register to record payment of voucher.

At the end of each month, after the total amount of postage used for the month had been determined, an entry would be made charging postage expense and reducing the prepayment account by a corresponding amount. The entry, assuming $4,000 in postage had been used, would be:

Operating Expenses (502)	$4,000	
Prepaid Postage (132.4)		$4,000

An entry in the General Journal to record the cost of postage for the month and to reduce the Prepaid Postage account by amount of such cost. SUBSIDIARY ACCOUNTS: *Debit* General Office Supplies and Expenses (793), $4,000.

A similar procedure would be followed wherever postage was purchased in large quantities.

In the case of small utilities, however, and, in certain instances, even in the case of large utilities, postage is frequently paid out of a petty cash fund. The operation of such fund is described in Chapter 14. As indicated there, the expenditure will not be recorded until either the time when it is necessary to replenish the petty cash fund, or at any time immediately preceding the preparation of statements, the entry being as follows:

Operating Expenses (502)	$15	
Vouchers Payable (222)		$15

An entry in the Voucher Register to record expenses paid for out of petty cash fund, for which the latter is to be reimbursed. SUBSIDIARY ACCOUNTS: *Debit* General Office Supplies and Expenses (793), $15.

Most of the other contractual services are of a minor character and would usually be handled through the petty cash fund. At any rate, the principles of handling such transactions have been

sufficiently illustrated to serve as a guide in recording those not mentioned.

Interest on Notes Payable

Interest is usually not paid in advance but at the time the loan is repaid, or at other regular intervals. However, where interest is paid in advance, the transaction is recorded by the following entries:

Prepaid Interest (132.3)	$100	
Vouchers Payable (222)		$100
An entry in the Voucher Register to record authorization to prepay interest.		
Vouchers Payable (222)	$100	
Cash (120)		$100
An entry in the Check Register to record payment of voucher.		

At the end of an accounting period, when it is necessary to set up interest expenses for the period, an entry is made recording the expense and reducing the Prepaid Interest account by a corresponding sum. The entry is as follows:

Interest on Notes (535.1)	$50	
Prepaid Interest (132.3)		$50
An entry in the General Journal to set up interest expense and to reduce the Prepaid Interest account correspondingly.		

An alternative procedure is to charge the full amount as interest expense at the time incurred and to set up the unexpired portion of the prepaid expenses as an asset at the time statements are prepared. This method is discussed in detail in Chapter 19.

One of the frequent cases involving the setting up of a Prepaid Interest account is in connection with discounting of non-interest-bearing notes. For example, assume that on December 1, the utility receives a non-interest-bearing note for $1,000 from one of its customers and that the note does not mature until February 28. Assume further that the note is discounted on December 14 at the bank at a discount rate of 6 per cent, the discount in that case amounting to $12.69. The following entry would be made at the time the note was discounted:

Cash (120)	$987.31	
Miscellaneous Income Deductions (538)	12.69	
Notes Receivable Discounted (221)		$1,000
An entry in the Cash Receipts Register to record receipt of proceeds after discounting of note.		

This discount is in the nature of an interest payment. Consequently, at the end of the accounting period an adjustment must be made so that the full amount of the discount will not be charged to the current period. In the present instance, the entry at December 31 would be as follows:

Prepaid Interest (132.3)	$9.85	
Miscellaneous Income Deductions (538)		$9.85
An entry in the General Journal to set up discount on notes applicable to the succeeding accounting period.		

All interest accrued on notes at the end of an accounting period must be taken into account in preparing financial statements. To make sure that all interest will be taken into account and to have a record of notes payable, a Notes Payable Register similar to that illustrated in Figure 70 is recommended.

The entry to record accrued interest on notes would be as follows:

Interest on Notes (535.1)	$100	
Interest Accrued (229)		$100
An entry in the General Journal to record interest accrued on notes payable.		

The amount of interest accrued on each note would be shown on the Notes Payable Register.

Taxes

Two distinctions must be made with reference to taxes. The first distinction is between taxes which constitute operating revenue deductions and those which do not. In general, most state, county, and municipal taxes constitute such deductions. However, special assessments or other taxes which tend to increase the value of property should be capitalized, that is, should be added to the cost of property deemed to be benefited. Similarly, taxes paid on property (including land) during the period of construction up to the time the facilities become

FIGURE 70

NOTES PAYABLE REGISTER

YEAR ——

No.	Date Issued	Payee	Maturity Date	Date Paid	Interest Rate	Amount	Interest Due					
							1/31	2/28	3/31	4/30	5/31	6/30
11	1/15	First National Bank	4/14	4/14	6 %	10,000.00	27.42	50.00	50.00	....	.....	.....
12	3/28	Fidelity Trust Co.	9/23	....	5 %	25,000.00	.....	.....	13.44	104.17	104.17	104.17
13	4/21	Blankville Savings & Trust	7/19	....	5½%	15,000.00	.....	.....	.....	22.92	68.75	68.75

available for service, are considered as part of the cost of the property constructed. The most important federal taxes to be paid by a private utility are federal income taxes. Such taxes are in some jurisdictions considered as operating revenue deductions, whereas in others they are treated as an appropriation of income.

Taxes which constitute operating revenue deductions may be classified according to whether or not they can be directly allocated to particular expense accounts. For example, sales taxes paid on materials can be directly allocated as part of the cost of such materials. In such cases, the taxes should be considered as, and added to, the cost of materials.

Taxes, with a few exceptions, are paid annually. It is, however, essential that the amount of taxes accrued to the date of the preparation of financial statements be included in such statements. The amount to be included will usually have to be estimated on the basis of past experience. As soon as the actual amount due is determined, proper adjustments would be made.

Each type of tax should be recorded separately. The entries to be made in connection with payroll taxes are discussed in Chapter 9. Other entries relate to sales taxes paid by the utility, taxes paid by the utility on purchases, general property taxes, special assessments, and income taxes.

Sales Taxes. The procedure in recording sales taxes will vary somewhat according to whether or not the customer is billed for the sales tax. Where the customer is billed for such tax, the amount of tax billed is computed at the time the analysis of revenue is prepared. An entry is then made somewhat as follows:

Accounts Receivable (125)	$10,000	
Taxes Accrued (228)		$10,000

An entry in the Sales Register to record sales taxes billed to customers.

Assuming, however, that the sales tax is not to be passed on to customers, the entry to record accrued sales taxes would be as follows:

Taxes (507)	$10,000	
Taxes Accrued (228)		$10,000

An entry in the General Journal to record sales taxes accrued.

When the sales taxes are paid, two entries are made, as follows:

Taxes Accrued (228)......................	$10,000	
Vouchers Payable (222)..................		$10,000
An entry in the Voucher Register to record authorization to pay sales tax.		
Vouchers Payable (222)....................	$10,000	
Cash (120)............................		$10,000
An entry in the Check Register to record payment of voucher.		

Sales taxes on materials purchased by the utility would be recorded as part of the cost of materials. No separate account would, therefore, be set up for such taxes unless it is desired to know what they amount to over a period of time. The entry, assuming that materials purchased cost $5,000, that the tax thereon amounts to $100, and that no separate tax account is set up, would be:

Materials and Supplies (131).................	$5,100	
Vouchers Payable (222)....................		$5,100
An entry in the Voucher Register to record purchase of materials.		

Property Taxes. Property taxes are usually paid annually, semi-annually, or quarterly. The dates of payment, however, may not correspond to the dates on which financial statements are prepared. Accordingly, it is necessary to set up the liability for taxes up to the time statements are prepared. The entry setting up the liability will be as follows:

Taxes (507)...............................	$1,000	
Taxes Accrued (228).....................		$1,000
An entry in the General Journal to record general property taxes accrued for month of December.		

When the tax bill is received, an adjustment will usually be found necessary. Assuming that the total amount of taxes accrued is $5,000, whereas the total amount of the tax bill is $5,500, the entry will be:

Taxes (507)..................................	$500	
Taxes Accrued (228)........................		$500
An entry in the General Journal to record general property taxes not previously set up.		

When the tax bill is paid, the following entry is made:

Taxes Accrued (228)	$10,000	
Vouchers Payable (222)		$10,000
An entry in the Voucher Register to record authorization to pay taxes.		

Vouchers Payable (222)	$10,000	
Cash (120)		$10,000
An entry in the Check Register to record payment of voucher.		

Special Assessments. Special assessments chargeable to pieces of property devoted to different activities, would first be recorded in a separate account and later allocated among the various fixed property accounts on some predetermined basis. At the time assessments become due, an entry is made as follows:

Taxes (507)	$25,000	
Taxes Accrued (228)		$25,000
An entry in the General Journal to record special assessments due.		

When the basis for allocating special assessment costs has been determined, the following entry, spreading such costs, will be made:

Utility Plant in Service (100.1)	$25,000	
Taxes (507)		$25,000
An entry in the General Journal to record allocation of cost of special assessments. SUBSIDIARY ACCOUNTS: *Debit* Power and Pumping Land (311.2), $16,000; Purification Land (311.3), $8,000; etc.		

Where special assessments are applicable to one piece of property, the cost can be charged directly to the piece of property involved, the entry being as follows:

Utility Plant in Service (100.1)	$16,000	
Taxes Accrued (228)		$16,000
An entry in the General Journal to record special assessments levied on power and pumping land. SUBSIDIARY ACCOUNTS: *Debit* Power and Pumping Land (311.2), $16,000.		

When the special assessments are paid, the following entry is made:

Taxes Accrued (228)	$25,000	
Vouchers Payable (222)		$25,000
An entry in the Voucher Register to record authorization to pay special assessments.		
Vouchers Payable (222)	$25,000	
Cash (120)		$25,000
An entry in the Check Register to record payment of voucher.		

In order to simplify the illustrations, it is assumed that special assessments are all paid at one time, whereas, in actual practice, they would probably be paid in installments.

Income Taxes. The entry to record income taxes when considered as operating revenue deductions is similar to that for property taxes. Where income taxes are not considered as operating revenue deductions, the entry to record the liability for such taxes is:

Miscellaneous Reservations of Net Income (540)	$10,000	
Taxes Accrued (228)		$10,000
An entry in the General Journal to record accrued federal income taxes, where taxes are not considered operating revenue deductions.		

Although the above entries do not include all taxes, it is believed that sufficient illustrations have been given to indicate what the procedure would be in the case of taxes not mentioned here. It is important to keep in mind, as indicated in the first part of this section, the distinction between the various types of taxes. It is particularly important to distinguish between taxes which constitute operating revenue deductions, such as general property taxes, and those which do not—as, for example, special assessments.

CHAPTER 11

DEPRECIATION

Introduction

Depreciation may be defined as the loss in service value of fixed assets other than wasting assets, due to wear and tear and obsolescence. In this chapter the attempt will be primarily to indicate the methods by which depreciation may be computed and the procedure in recording the same rather than to discuss the theories underlying the various methods. Nevertheless, the discussion of a few principles is essential to an understanding of the methods illustrated. Some of the methods illustrated include the straight-line, the sinking-fund, the work-unit, and the retirement reserve methods.

Straight-Line Method

Under this method, the probable life and the net salvage value of each asset are estimated, the depreciation per year being determined by dividing the total amount to be depreciated by the estimated life of the asset. For example, assuming the facts illustrated below, the total amount of depreciation to be charged to revenue each year during the life of the asset would be $1,000, determined as follows:

Estimated life of asset..............	10 years	
Cost	$10,500	
Estimated salvage value at end of 10 years	500	
Total amount to be depreciated.....	$10,000	
Amount to be depreciated each year..	$1,000	($10,000 ÷ 10)

A schedule of annual depreciation charges for such an asset is illustrated in Table 1.

The following entries will help to illustrate how depreciation charges are recorded under the straight-line method. Assuming that such charges are not recorded until the end of the year, the entry at that time would be:

Depreciation (503)	$1,000	
Reserve for Depreciation of Utility Plant (250)		$1,000

An entry in the General Journal to record depreciation of pumping machinery.

If cash equivalent to depreciation charges is set aside in a separate bank account, the following entry is made:

Depreciation Fund (115)	$1,000	
Vouchers Payable (222)		$1,000

An entry in the Voucher Register to record authorization to contribute to depreciation fund. SUBSIDIARY ACCOUNTS: *Debit* Depreciation Fund Cash (115.1), $1,000.

Vouchers Payable (222)	$1,000	
Cash (120)		$1,000

An entry in the Check Register to record payment of voucher.

TABLE 1

DEPRECIATION CHARGES UNDER STRAIGHT-LINE METHOD

End of Year	Amount of Depreciation to be Charged	Depreciation Reserve	Amount not yet Depreciated
1	$1,000	$ 1,000	$9,000
2	1,000	2,000	8,000
3	1,000	3,000	7,000
4	1,000	4,000	6,000
5	1,000	5,000	5,000
6	1,000	6,000	4,000
7	1,000	7,000	3,000
8	1,000	8,000	2,000
9	1,000	9,000	1,000
10	1,000	10,000	....

Sinking-Fund Method

The sinking-fund method assumes that depreciation in any year will be the same as the increase in the value of a sinking fund figured for the same age and life. The fund also operates on the assumption that a sum of money equivalent to the annual charge for depreciation will be set aside each year and left to accumulate at compound interest. Three elements are, therefore, involved in the computation of the depreciation charges under this method. They are (1) the depreciable value of the asset, (2) the interest rate which the annual contributions will

earn, and (3) the length of time each installment will be held in the fund.

The procedure in determining the amount to be charged annually is as follows:

1. Determine the depreciable value (that is, deduct estimated scrap value from cost).
2. Determine the life of the asset.
3. Divide the depreciable value by the amount of an annuity of 1 at the rate of interest which each installment will earn for the number of years the asset will be useful. This will give the amount which should be placed in the sinking fund each year.
4. Multiply the amount assumed to be accumulated in the fund at any particular period by the rate of interest the fund is assumed to earn and add the product to the amount arrived at in (3), that is, to the amount to be placed in the sinking fund, to determine the annual depreciation charge.

To illustrate: Assume that an asset is estimated to last 10 years, that its total value is $10,500, and that its estimated scrap value is $500. Assume further that a sinking fund is to be established in which contributions are to be accumulated, such accumulations to earn 6 per cent per annum. The amount of depreciation charges during the first, second, and third years will be determined as follows:

First Year

1.	Total value of asset	$10,500
	Less—Scrap value	500
	Amount to be depreciated	$10,000

2. Life of asset—10 years
3. Amount of an annuity of 1 at 6 per cent for 10 years = 13.180795 (arrived at by using the formula $\frac{(1+i)^n - 1}{i}$ where n represents the number of years and i the rate of interest).

   $10,000 (depreciable value) ÷ 13.180795 (amount of annuity of 1) = $758.68, which is the amount that must be contributed annually to a sinking fund for a period of ten years in order to accumulate an amount equal to $10,000. It will be noted that $758.68 multiplied by 10 will only give about $7,600; the remaining sums to be

added to the fund will arise from interest earnings. This amount is also the sum which will be charged as depreciation during the first year.

Second Year

Since an equal amount is assumed to be placed in the fund each year, the periodic contribution will be $758.68. However, the charge to depreciation will now be greater since interest of 6 per cent on the amount in the fund at the end of the year will be added. Specifically, the amount charged as depreciation will be calculated as follows:

Periodic deposit in sinking fund.....................	$758.68
Interest on funds accumulated at end of first year (6% of $758.68)....................................	45.52
Total depreciation charge for year.............	$804.20

Third Year

The depreciation charge for the third year will be determined as follows:

Periodic deposit in sinking fund....................	$758.68
Interest on funds accumulated at end of second year [6% of ($758.68 + $804.20)]..........................	93.77
Total depreciation charge for year..............	$852.45

Table 2 shows the amount which would be accumulated annually in a sinking fund for a period of ten years, and Table 3 shows depreciation charges for each year.

Entries. The following entries should help in illustrating the procedure in recording depreciation charges under the sinking-fund method. To simplify the discussion, it is assumed that charges are to be recorded annually. It is not essential that an actual fund be set up even under the sinking-fund method, calculations merely being based on a theoretical assumption that such a fund will be established. Assuming that no fund is set up, the entry to record depreciation charges at the end of the first year will be:

Depreciation (503)........................	$758.68	
Reserve for Depreciation of Utility Plant (250)		$758.68

An entry in the General Journal to record depreciation at end of first year.

Table 2

CONTRIBUTIONS TO SINKING FUND, INTEREST THEREON, AND TOTAL ACCUMULATION

End of Year	Amount to be Contributed	Amount Earned	Total Annual Contributions and Earnings	Total Assets Accumulated in Fund
1	$758.68	......	$ 758.68	$ 758.68
2	758.68	$ 45.52	804.20	1,562.88
3	758.68	93.77	852.45	2,415.33
4	758.68	144.92	903.60	3,318.93
5	758.68	199.14	957.82	4,276.75
6	758.68	256.61	1,015.29	5,292.04
7	758.68	317.52	1,076.20	6,368.24
8	758.68	382.09	1,140.77	7,509.01
9	758.68	450.54	1,209.22	8,718.23
10	758.68	523.09	1,281.77	10,000.00

Table 3

DEPRECIATION CHARGES UNDER SINKING-FUND METHOD

End of Year	Depreciation Charge	Accumulated Depreciation Reserve	Amount Remaining to be Depreciated
1	$ 758.68	$ 758.68	$9,241.32
2	804.20	1,562.88	8,437.12
3	852.45	2,415.33	7,584.67
4	903.60	3,318.93	6,681.07
5	957.82	4,276.75	5,723.25
6	1,015.29	5,292.04	4,707.96
7	1,076.20	6,368.24	3,631.76
8	1,140.77	7,509.01	2,490.99
9	1,209.22	8,718.23	1,281.77
10	1,281.77	10,000.00	......

At the end of the second year a similar entry will be made, except that the amount of depreciation charged will be greater. Specifically, the entry will be:

Depreciation (503)	$804.20	
Reserve for Depreciation of Utility Plant (250)		$804.20

An entry in the General Journal to record depreciation at end of second year.

At the end of the third year, the amount to be charged will be $852.45, and charges will continue to increase with the life of the asset, as is evident from Table 3. Except for the amount

charged, identical entries will be made at the end of each year.

Assume, on the other hand, that the fund is actually established. The entries to set up depreciation charges each year will, in that case, be similar to those where no fund is established. For example, at the end of the first year, assuming that depreciation is recorded annually, the entry will be:

Depreciation (503)	$758.68	
Reserve for Depreciation of Utility Plant (250)		$758.68
An entry in the General Journal to record depreciation at the end of the first year.		

However, additional entries must be made setting up the fund. These will be as follows:

Depreciation Fund (115)	$758.68	
Vouchers Payable (222)		$758.68
An entry in the Voucher Register to record authorization to contribute to depreciation fund. SUBSIDIARY ACCOUNTS: *Debit* Depreciation Fund Cash (115.1), $758.68.[1]		
Vouchers Payable (222)	$758.68	
Cash (120)		$758.68
An entry in the Check Register to record payment of cash.		

At the end of the second year, interest earnings must also be taken into account. Four entries will therefore be involved, as follows:

Depreciation (503)	$804.20	
Reserve for Depreciation of Utility Plant (250)		$804.20
An entry in the General Journal to record depreciation charges at the end of the second year.		
Depreciation Fund (115)	$758.68	
Vouchers Payable (222)		$758.68
An entry in the Voucher Register to record authorization to contribute to depreciation fund.		

[1] Theoretically some such subsidiary account as Due from Utility General Fund should be debited at first. It is assumed, however, that very little time elapses between the issuance of the voucher and the check, so that for practical purposes Depreciation Fund Cash may be debited directly and the accounting procedure thereby simplified.

SUBSIDIARY ACCOUNTS: *Debit* Depreciation Fund Cash (115.1), $758.68.[2]

Vouchers Payable (222)	$758.68	
Cash (120)		$758.68

An entry in the Check Register to record payment of cash.

Depreciation Fund (115)	$45.52	
Revenues from Depreciation Fund (525.2)		$ 45.52

An entry in the General Journal to record interest accrued on depreciation fund investments. SUBSIDIARY ACCOUNTS: *Debit* Accrued Interest on Depreciation Fund Investments (115.3), $45.52.

The entries at the end of the third year will be similar to those for the second year, except that different amounts are involved in the first and last entries. Specifically, the entries at the end of that year will be:

Depreciation (503)	$852.45	
Reserve for Depreciation of Utility Plant (250)		$852.45

An entry in the General Journal to record depreciation charges at the end of the third year.

Depreciation Fund (115)	$758.68	
Vouchers Payable (222)		$758.68

An entry in the Voucher Register to record authorization to contribute to depreciation fund. SUBSIDIARY ACCOUNTS: *Debit* Depreciation Fund Cash (115.1), $758.68.[2]

Vouchers Payable (222)	$758.68	
Cash (120)		$758.68

An entry in the Check Register to record payment of voucher.

Depreciation Fund (115)	$ 93.77	
Revenues from Depreciation Fund (525.2)		$ 93.77

An entry in the General Journal to record interest accrued on depreciation fund investments. SUBSIDIARY ACCOUNTS: *Debit* Accrued Interest on Depreciation Fund Investments (115.3), $93.77.

By referring to Tables 2 and 3, the reader can readily determine the amount of depreciation to be charged, the amount to be contributed, and the interest which should be earned, each

[2] See footnote on preceding page.

year. A comparison of the last column in Table 2 with the figures in the third column of Table 3 reveals that the value of assets in the fund should equal the accumulated reserve for depreciation. Deficiencies will usually arise out of the fact that the interest earnings are not so great as anticipated. Deficiencies should be made up either by revising the schedule of contributions higher, so as to absorb present and probable future deficiencies, or by a special contribution either out of current revenues or surplus. It should be noted that the assumption here is that interest will be received annually. If interest is received at more frequent intervals, a corresponding adjustment will be necessary.

Work-Unit Method

This method is similar to the straight-line method, except that depreciation is based on the amount of work performed rather than on time. The procedure is to estimate the total number of units of work which the asset will be able to perform during its life. Then, in order to arrive at the rate per unit, the net value of the asset (that is, total value less estimated salvage value) is divided by the total number of units. The amount to be charged to any accounting period is arrived at by multiplying the number of units of work performed during that period by the rate.

The following example illustrates the work-unit method of arriving at depreciation to be charged for any period.

Asset: Truck

Cost	$1,000	
Salvage value	200	
Amount to be depreciated	$800	
Estimated mileage	40,000	miles
Depreciation rate	$0.02	per mile
Number of miles covered during first year	8,000	
Depreciation chargeable to first year	$ 160	(8,000 × $0.02)
Number of miles covered during second year	6,000	
Depreciation chargeable to second year	$ 120	(6,000 × $0.02)

Table 4 shows annual depreciation charges, accumulated depreciation at the end of the year, and amount remaining to be

depreciated, assuming a certain number of work units are performed each year.

A modification of this method is to depreciate the asset on a straight-line basis but to allocate depreciation charges on the basis of work units. Under this method, in order to arrive at the rate to be applied to jobs, the amount of depreciation for the year is divided by the total estimated number of units.

TABLE 4

DEPRECIATION CHARGES, ACCUMULATED DEPRECIATION, AND NET VALUE OF ASSET

Work-Unit Method
(Assuming rate of \$0.02 per Work-Unit)

End of Year	No. of Units	Depreciation Charge	Accumulated Depreciation	Amount to be Depreciated
1	8,000	\$160	\$160	\$640
2	6,000	120	280	520
3	9,000	180	460	340
4	7,000	140	600	200
5	10,000	200	800	...

The entries involved in setting up depreciation charges under the work-unit method are similar to those for straight-line depreciation and will, therefore, not be repeated here.

As said before, this method is practicable only with certain types of assets. It is especially adapted to assets the depreciation of which is dependent to a great extent on the amount of work performed. Depreciation is easily computed under this method. For a detailed illustration of its application, see pages 245 and 246.

Retirement Reserve Method

Under this method there is included in operating expenses an annual provision for retirements and a corresponding retirement reserve is set up. The annual provision is usually made on the basis of past experience. The purpose of the reserve is to equalize the effect of losses occasioned by the retirement or replacement of property.

Amortization of Intangible Fixed Assets

Amortization of intangible fixed assets involves the same principles as depreciation of fixed assets, namely, spreading the

cost, or other assigned value, of the asset over its life in such manner that each period is charged with a proportionate share of the value of the asset. The proportion to be charged should usually correspond to the benefits received from the use of the asset during the particular period in so far as such benefits can be determined. In view of the fact that it is necessary to understand the nature of each intangible asset in discussing the method of amortization followed and the entries involved, the subject is discussed in Chapter 17.

CHAPTER 12

DISTRIBUTION OF CLEARING ACCOUNTS

Introduction

A clearing account is one in which various elements of cost are collected for later redistribution among the jobs and activities benefited. Four of the most common clearing accounts are:

1. Stores Expenses—Clearing (902)
2. Transportation Expenses—Clearing (904)
3. Laboratory Expenses—Clearing (906)
4. Shop Expenses—Clearing (908)

Each of these is discussed in detail below.

Stores Expenses—Clearing

Stores expenses represent the cost of handling materials. A separate account should be provided for recording each object of stores expenditure, such as labor, supplies, depreciation, etc. The following are entries for a few of the more common stores expenses:

Stores Expenses—Clearing (902)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record wages of storekeeper and assistants. SUBSIDIARY ACCOUNTS: *Debit* Labor (902.2), $500.

Stores Expenses—Clearing (902)	$50	
Taxes Accrued (228)		$50

An entry in the General Journal to record allocation of a proportionate share of taxes to Stores Expenses—Clearing account. SUBSIDIARY ACCOUNTS: *Debit* Other Stores Expenses (902.6), $50.

Stores Expenses—Clearing (902)	$500	
Reserve for Depreciation of Utility Plant (250)		$500

An entry in the General Journal to record charging Stores Expenses—Clearing account with depreciation of stores equipment. SUBSIDIARY ACCOUNTS: *Debit* Depreciation (902.5), $500.

As materials and supplies are charged to jobs and activities, a proper proportion of the stores expenses is allocated. The amount to be charged is arrived at by applying a certain percentage to the cost of materials used. The percentage is determined as follows: On the basis of past experience, total probable stores expenses are estimated. A similar estimate is made of the probable cost of materials to be issued. Estimated total stores expenses are then divided by the total estimated cost of materials in order to arrive at the percentage to be applied. Estimates are usually made for a year but may be made for a shorter period.

To illustrate the procedure in making estimates, assume that total stores expenses for the forthcoming year are estimated to be $10,000, and the cost of materials which will be used during the same period is estimated to be $500,000; then the rate applicable to materials issued is 2 per cent ($10,000 ÷ $500,000). Assuming that the cost of materials used on Work Order No. 50 is $1,000, the amount to be charged as stores expense to this job is $20 (2% of $1,000).

The entry to record the allocation of the cost of materials and stores expense, assuming that the work order is for a construction project, would be:

Construction Work in Progress (100.3).........	$1,020	
Materials and Supplies (131)...............		$1,000
Stores Expenses—Clearing (903)............		20
An entry in the General Journal to record cost of materials used on Work Order No. 50.		

If stores expenses and cost of materials used have both been accurately estimated, no balance will be left in the Stores Expenses—Clearing account at the end of the year. Usually, however, some balance will remain, the reason being that stores expenses were overestimated or cost of materials used underestimated. Theoretically, this balance should be redistributed among the jobs and activities on which the material was used during the year. This procedure, however, is impractical. Accordingly, the difference is frequently charged to Miscellaneous General Expenses (801), the entry being:

Operating Expenses (502).......................	$500	
Stores Expense—Clearing (903)................		$500

An entry in the General Journal to record disposal of difference between actual stores expenses for the year and total of expenses charged to jobs. SUBSIDIARY ACCOUNTS: *Debit* Miscellaneous General Expenses (801), $500.

A problem similar to the above would arise if the rates charged were too high, resulting in an overabsorption of the Stores Expenses—Clearing account. In such a case, the difference might be adjusted by crediting it to an operating expense account, the entry being:

Stores Expenses—Clearing (903)..................	$500	
Operating Expenses (502)....................		$500

An entry in the General Journal to record disposal of difference between stores expenses charged to jobs and actual stores expenses. SUBSIDIARY ACCOUNTS: *Credit* Miscellaneous General Expenses (801), $500.

The two adjustments indicated above were assumed to be made at the end of the year. Frequently, however, it becomes evident during the middle of the year that the rate has been set too high or too low, in which event the rate to be charged to future jobs during the year would be adjusted to absorb the amount over- or undercharged, and no entries will be needed.

Transportation Expenses—Clearing

The purpose of this account is to accumulate the expenses connected with the operation of the utility's transportation equipment. These expenses include the cost of gas, oil, and other supplies, materials and labor used in repairing and maintaining equipment, depreciation of equipment and garage, taxes on equipment and garage, and general overhead. The method of charging the expenditures to the clearing account will be discussed first, following which the method of clearing out the expenses charged will be discussed. The account does not include the salaries of equipment operators because, although such salaries constitute transportation expenses, it is assumed they are allocated to jobs and activities independently of equipment operation costs. The reason for such an assumption is that the actual amount of such salaries and wages as are applicable to each job and activity can be readily determined, whereas the other costs of operating equipment are allocated on the basis of a predetermined rate.

FIGURE 71

INDIVIDUAL EQUIPMENT RECORD

FOR YEAR ENDING ____________ 19__

(Showing source of entries to each column)

1. Equipment No.____________
2. Motor No.________ Serial No.________
3. Make____________
4. Type____________
5. Capacity____________
6. Date Purchased____________
7. Original Cost . . . . $________
8. Value Start of this Year . . . . $________

Month	Gasoline		Oil		Tires and Supplies	Maintenance Labor		Repair Labor		Repair Parts	Outside Repairs	Overhead
1	2		3		4	5		6		7	8	9
	Gals.	Amt.	Qts.	Amt.	Amt.	Hrs.	Amt.	Hrs.	Amt.	Amt.	Amt.	Amt.
	Monthly Summary of Cost of Gas, Oil, and Supplies Used — Figure 73					Monthly Summary of Equipment Maintenance and Repair Labor — Figure 78				Monthly Summary of Repair Parts Used — Figure 80	Vouchers — Figure 52	Monthly Summary of Equipment Overhead Expenses — Figure 81
	Inventory of Gas and Oil — Figure 76					Mechanic's Job Time Ticket — Figure 79						
	Daily Report of Gas, Oil, and Supplies Issued — Figure 75					Service Request and Job Order — Figure 77				Materials Requisition — Figure 56		
	Gas, Oil, and Supplies Requisition — Figure 74											

Continued on next page.

FIGURE 71 (Continued)

INDIVIDUAL EQUIPMENT RECORD

FOR YEAR ENDING ____________ 19__

(Showing source of entries to each column)

9. Estimated Salvage Value.........$________
10. Remaining Depreciation.........$________
11. Estimated Depreciation This Yr...$________
12. Estimated Hours or Miles This Yr. $________

13. Depreciation Rate per Hour......$________
per Mile......$________
14. Rental Rates {Date____ Rate____ per Mile or Hour
{Date____ Rate____ per Mile or Hour

Continued from preceding page.

Total Direct Expense	Depreciation	Total Cost	Mileage First of Month	Miles Run	Hours Run	Cost per Mile	Cost per Hour	Miles per Gallon	Rentals Earned (Credits)
10	11	12	13	14	15	16	17	18	19
Amt.	Amt.	Amt.				Amt.	Amt.		Amt.
Total of Amounts in Columns 2 to 9 inclusive	Figures in Columns 14 or 15 multiplied by rate shown as item 13 at top of record	Total of columns 10 and 11	Monthly Summary of Equipment Miles and Hours Run — Figure 82; Equipment Operator's Daily Report — Figure 93			Column 12 ÷ Column 14	Column 12 ÷ Column 15	Column 14 ÷ Column 2	Column 14 or 15 × Rental Rate

Individual Equipment Record. The basic data for arriving at the cost of operating each piece of equipment are gathered on an Individual Equipment Record, a form for which is illustrated in Figure 71. The following discussion is concerned primarily with the method of collecting the data shown in each column of this record.

The Individual Equipment Record is prepared for a yearly period. Except for equipment purchased during the year, the record is prepared at the beginning of the year. The data shown in the upper part of the record are derived from an Equipment Inventory and Depreciation Schedule (Figure 72), which is set up at the beginning of each year. The figures for columns 1 to 12 of the schedule are derived from an Equipment History Record (Figure 84) described in detail later. Estimates of salvage value, remaining life, and depreciation for the year, are usually based on actual experience with the piece of equipment and similar other equipment. The number of hours a piece of equipment will be used, and the number of miles to be covered by it, are estimated on the basis of past experience. The data in the last column, that is, the depreciation rate per hour or per mile, are arrived at by dividing the estimated depreciation for the year by the estimated hours or miles for the same period. Passenger cars are commonly depreciated on the basis of estimated number of miles to be run, whereas trucks are depreciated on the basis of estimated number of hours to be used during the year.

As soon as the Equipment Inventory and Depreciation Schedule has been filled out, the data are transferred to the Individual Equipment Record. For equipment acquired during the year, the figures at the top part of the Individual Equipment Record are based partly on the Equipment History Card and in part on estimates made at the time the card is filled out.

Thus far the discussion has been concerned with the data shown at the top of each equipment record. This information is, as mentioned previously, recorded at the beginning of the year. On the other hand, the figures for each of the columns are filled in at the end of each month. Throughout the following discussion, column references are to the column numbers of the Individual Equipment Record.

Gas, Oil, and Supplies (Columns 2, 3, and 4). The figures

FIGURE 72

EQUIPMENT INVENTORY AND DEPRECIATION SCHEDULE

January 1, 19....

Equipment No.	Department Using	Make	Type	Capacity	Motor No.	Serial No.	Date Purchased	Original Cost	Accrued Depreciation	Value at Start of This Year	Estimated Salvage Value	Net Amount Subject to Depreciation	Remaining Life	Estimated Depreciation This Year	Estimated Hours or Miles This Year	Depreciation Rate per Hour or per Mile
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Continued below.

Continuation of upper part.

FIGURE 73

MONTHLY SUMMARY OF COST OF GAS, OIL, AND SUPPLIES USED

For Month Ending ....

Date	EQUIPMENT NO.					EQUIPMENT NO.					EQUIPMENT NO.				
	Gas (Gals.)	Oil (Qts.)	Tires and Supplies			Gas (Gals.)	Oil (Qts.)	Tires and Supplies			Gas (Gals.)	Oil (Qts.)	Tires and Supplies		
			Name	No. of Units	Cost			Name	No. of Units	Cost			Name	No. of Units	Cost
Total															
Cost per Unit															
Total Cost															

FIGURE 74

GAS, OIL, AND SUPPLIES REQUISITION

No.________

Supplied to:
Equip. No.______________ Date______________ Serial Number________

or to ____________________ Speedometer Reading______________

Station____________ Dispensed by______________ Hrs. Worked Since Last Serviced________

Commodity		Unit	Quan.
Gasoline		Gals.	
Motor Oil		Qts.	
Grease		Lbs.	
Antifreeze		Qts.	
Kerosene		Qts.	
Tire (Kind and Size	)	No.	
Tube (Kind and Size	)	No.	

I certify to the receipt of the above supplies:

Signed ____________________________

for these columns are secured from a Monthly Summary of Cost of Gas, Oil, and Supplies Used. A form for such a summary is illustrated in Figure 73. The amount to be entered daily in each column of the summary is arrived at as follows: As gas, oil, and supplies are furnished for a piece of equipment, a Gas, Oil, and Supplies Requisition (Figure 74) is filled out in duplicate and signed by the driver. At the end of each day, the person who has charge of servicing equipment sorts the tickets by equipment number and fills out a report showing the amount of gas, oil, and other supplies issued for each piece of equip-

FIGURE 75

DAILY REPORT OF GAS, OIL, AND SUPPLIES ISSUED

Date____________________

Equipment No.	Gasoline (Gallons)	Oil (Quarts)	Other Supplies (Specify in detail)

Signed ____

Storekeeper or Station Attendant

FIGURE 76

INVENTORY OF GAS AND OIL

Date________________

Date	Received From	Gallons of Gas	Quarts of Oil
	Total Received for Week		
	Amount Issued (See Figure 75)		
	Total to be Accounted For		
	Amount Actually on Hand (Date)		
	DIFFERENCE		

Reason for Variation:________________

ment. A form for such a report is illustrated in Figure 75. The report, together with carbon copies of the tickets, is transmitted daily to the central stores office, where the report is used for posting to the Monthly Summary of Cost of Gas, Oil, and Supplies Used. An alternative procedure is to transmit the tickets directly to the stores central office, where they would be sorted and have postings made directly from them to the monthly summary.

At the end of the month, each of the "Gas" and "Oil" columns of the summary is totaled in order to arrive at the total amount of gas and oil used. The next step is to price quantities used. To do this, it is necessary to arrive at the cost per unit (that is, per gallon of gas, quart of oil, etc.). The purchasing department would notify the stores office of the unit price paid. However, in the case of gas and oil, losses due to evaporation are quite likely and must be taken into account in computing unit costs. Provision, therefore, should be made for a weekly inventory of gas and oil. A form for an inventory sheet is illustrated in Figure 76. The total amount shown by the inventory is compared with the total amount which should be on hand, the latter amount being determined by adding receipts during the week to the inventory on hand at the beginning of the week, and deducting therefrom the amount issued during the week. The difference, representing the amount probably lost through evaporation, should be apportioned among the various pieces of equipment on the basis of the number of gallons of gas and quarts of oil used by each respectively. The losses should be cumulated weekly but should not be allocated until the total loss for the month is determined.

To illustrate the allocation of losses, assume that the total loss is 20 gallons of gas and that two vehicles are involved, vehicle A having used 300 gallons of gas and vehicle B, 200. The loss is apportioned by adding 12 gallons (3/5 of 20) to the volume used by vehicle A and 8 gallons (2/5 of 20) to the volume used by vehicle B. However, if the loss is greater than what can be normally expected under the weather conditions prevailing during the week, further investigation is necessary to establish the reason therefor.

After losses have been prorated, the total cost is arrived at by multiplying the unit cost by the amount, including appor-

FIGURE 77

EQUIPMENT DIVISION

SERVICE REQUEST AND JOB ORDER

JOB NO.__________

DATE__________

DEPARTMENT__________ EQUIP. NO.__________

BRAKES	ELECTRICAL	TRANSMISSION	MISCELLANEOUS
☐ Hand	☐ Battery	☐ Clutch	☐ Radiator
☐ Foot	☐ Horn	☐ Gear Box	☐ Fan
MOTOR	☐ Headlights	☐ Drive Chain	☐ Hoist
☐ Carburetor	☐ Tail Light	☐ Sprockets	☐ Body
☐ Knocks	☐ Stop Light	☐ Rear End	☐ Cab and Doors
☐ Heats	☐ Starter	SPRINGS	☐ Wheels
☐ Misses	☐ Generator	☐ Front	☐ Fenders
☐ No Power	☐ Ignition	☐ Rear	☐ Tail Board
☐	☐	☐	☐

OTHER NECESSARY REPAIRS__________

SERVICE REQUESTED BY __________ OPERATOR

WORK ORDERED BY __________ SUPT. OF EQUIPMENT

MECHANICS REPORT OF WORK DONE

DATE	DESCRIPTION OF WORK DONE	MECHANICS PAY. NO.

MAINT. ITEM	DATE	MILEAGE	MAINT. ITEM	DATE	MILEAGE
A. CHANGE OIL			G. GREASE TRANS.		
B. CHECK TIRES			H. CHECK ANTI-FR.		
C. CHECK BATTERY			I. GREASE CHAS.		
D. ADJUST LIGHTS			J. TUNE MOTOR		
E. CHECK ALIGN.			K. HOIST		
F. GREASE DIFFER.			L.		

SIGNED__________ MECHANIC

tioned losses, used by each vehicle during the month. The total cost of other supplies would also be arrived at by multiplying the number of units of each type of supply used by the unit cost price. For methods of arriving at the unit cost figure, see pages 174 and 175. After the costs of gas, oil, and supplies used are determined for each vehicle, the figures representing quantity used and cost of same are posted to the appropriate columns of the Individual Equipment Record. The total quantity and

FIGURE 78

MONTHLY SUMMARY OF EQUIPMENT MAINTENANCE AND REPAIR LABOR

For Month Ending____________

Date	EQUIPMENT No. *11*				EQUIPMENT No. *12*				EQUIPMENT No. *13*			
	Maintenance		Repairs		Maintenance		Repairs		Maintenance		Repairs	
	Hrs.	Amt.	Hrs.	Amt.	Hrs.	Amt.	Hrs.	Amt.	Hrs.	Amt.	Hrs.	Amt.

cost of gas used are posted to column 2, total quantity and cost of oil to column 3, and total cost of supplies to column 4.

Maintenance and Repair Labor (Columns 5 and 6). Before proceeding to discuss the manner in which data for columns 5, 6, and 7, dealing with maintenance and repair costs, are secured, a brief description of the procedure to be followed in requesting service on equipment will be given. Requests for service originate usually from equipment operators. Whenever the operator wishes to have equipment serviced, a Service Request and Job Order form (Figure 77) is filled out by him indicating work to be done. The cards are then approved by the foreman and serve as authorizations to do the work. They

are used, in addition, to show the nature of work done and related information. Costs are not accumulated on them but in the manner indicated below. The number of hours of maintenance and repair labor and the cost thereof are derived from a Monthly Summary of Equipment Maintenance and Repair Labor, a form for which is shown in Figure 78.

The data for this form are derived from the Mechanic's Job Time Ticket, illustrated in Figure 79. This report is filled out by the mechanic each time he finishes work on a car, and at the end of the day each mechanic submits his card to the foreman for approval, after which the cards are sent to the cost accounting office. Here the number of hours put in on each piece of equipment is multiplied by the proper rate in order to arrive at the cost of labor for servicing or repairing pieces of equipment. After all the tickets for the day have been computed, the number of hours and the cost of labor are posted opposite the proper piece of equipment on the Monthly Summary of Equipment Maintenance and Repair Labor. The Mechanic's Job Time Ticket is then transmitted to the payroll department to be used in making up the payroll. At the end of each month, the Summary of Equipment Maintenance and Repair Labor is totaled, and the total number of hours and cost of labor for each car are posted to columns 5 and 6 of each Individual Equipment Record.

Repair Parts (Column 7). The data for this column are derived from a Monthly Summary of Repair Parts Used, illustrated in Figure 80. The daily charges are based on requisitions approved by the foreman, which are similar to those described and illustrated on pages 165–167. As indicated previously, a copy of the requisition is retained by the storekeeper. This copy is transmitted to the cost accounting office, where it is priced and the cost of repair parts withdrawn on the requisition determined. The amount is then entered on the Monthly Summary of Repair Parts Used.

If more parts have been requisitioned than are needed on the job, the excess is returned on a Materials Return Ticket similar to that shown in Figure 57, except that the equipment number to be credited must be indicated on this form. The return ticket is then priced and the total credit deducted from the requisition if the latter has not yet been entered on the summary. Other-

FIGURE 79

MECHANIC'S JOB TIME TICKET

Date.............................19....

Name.. No.......................................

Foreman.. Rate $.....................................

Class of Equipment	Equip. No.	Maintenance		Repairs		Clock Reading
		Hrs.	Amount	Hrs.	Amount	
1	2	3	4	5	6	7
Totals for Day						

Instructions: List each job for the day with the time for each. Use separate lines for general shop service items.

FIGURE 80

MONTHLY SUMMARY OF REPAIR PARTS USED

For Month Ending________________

Date	EQUIPMENT NO.__		EQUIPMENT NO.__		EQUIPMENT NO.__		EQUIPMENT NO.__		EQUIPMENT NO.__		EQUIPMENT NO.__	
	Requisition No.	Amount	Requisition No.	Amount	Requisition No.	Amount	Requisition No.	Amount	Requisition No.	Amount	Requisition No.	Amount

FIGURE 81

MONTHLY SUMMARY OF EQUIPMENT OVERHEAD EXPENSES

For Month Ending________________

Total Overhead Expenses for Month__________
Total No. of Labor Hours______
Rate per Labor Hour________

Equipment No.	Labor Hours	Amount	Equipment No.	Labor Hours	Amount

wise, the credit is entered in red on the monthly summary immediately above the requisition to which it applies.

Where the garage is located at some distance from the storeroom, a sub-storeroom may be established. In that case, a certain amount of repair parts is issued to the garage foreman on a requisition signed by him and approved by the person in charge of equipment repairs and servicing. Parts are issued by the foreman or by another person designated by him upon requisitions signed by mechanics and approved by the foreman. These requisitions are turned over to the storekeeper, who replenishes the sub-storeroom by the amount used, as evidenced by the requisitions. The requisitions are, in turn, submitted to the stores office, where the price and total cost of parts used on each piece of equipment is calculated and posted to the Monthly Summary of Repair Parts Used (Figure 80).

Outside Repairs (*Column 8*). The data for this column may be posted directly from vouchers or a voucher distribution sheet.

Overhead (*Column 9*). Overhead includes all the expenses connected with operating equipment which cannot be assigned directly to any one piece of equipment. These expenses include, among others, the salary of the superintendent of equipment, salaries of foremen, use of small tools and of such supplies as grease, paint, rags, and a proportionate part of the expense of operating the cost accounting office. They are compiled in an equipment overhead account, in which indication is made of the amount to be distributed to the various pieces of equipment (Figure 81). The basis of distribution of overhead expenses most frequently used is the number of labor hours spent on each piece of equipment during the month. A labor hour is an hour of work put in by one employee. Thus, for example, if one mechanic works four hours on an automobile, four labor hours are considered to have been spent on the job. If, instead, four employees had worked an hour, the total number of labor hours put in would also have been four.

The procedure in allocating overhead expenses is as follows: The expenses are posted to the appropriate overhead accounts (Supervision (904.1), Heat, Light, and Power (904.4), and Other Transportation Expenses (904.6). The total of the balances of these accounts is entered on a Monthly Summary of Equipment Overhead Expenses (Figure 81), to which are also posted the total number of labor hours put in on all equipment repaired as well as the total number of labor hours for each piece of equipment. The total of all overhead expenses is then divided by the number of labor hours, in order to arrive at the rate per labor hour. Overhead expenses are allocated to each piece of equipment by multiplying the rate per labor hour by the number of labor hours spent on it.

After the amount of overhead expense for each piece of equipment is determined, postings are made to column 9 of each Individual Equipment Record.

Total Direct Expense (*Column 10*). The amount in this column is secured by adding the amounts in columns 2 to 9 inclusive.

Depreciation (*Column 11*). The amount of depreciation to be charged for the month is arrived at by multiplying either the figures in the "Miles Run" column (No. 14) by the depreciation rate per mile shown at the top of the record, or the figure in the

"Number of Hours Run" column (No. 15) by the rate per hour shown in the upper part of the record. The manner of securing the total number of hours and miles will be indicated subsequently. As stated before, depreciation of passenger cars is usually based on the number of miles traveled, whereas trucks are depreciated on the basis of the number of hours used.

FIGURE 82

MONTHLY SUMMARY OF EQUIPMENT MILES AND HOURS RUN

During Month Ending______________________

Date	Equipment No. *10*		Equipment No. *11*		Equipment No. *12*		Equipment No. *13*	
	No. of Miles	No. of Hours	No. of Miles	No. of Hours	No. of Miles	No. of Hours	No. of Miles	No. of Hours

Total Cost (Column 12). Total cost is secured by adding the figures in columns 10 and 11. The sum of the "Total Cost" columns of the Individual Equipment Records equals the total amount for which the Transportation Expenses—Clearing account should be charged.

Mileage First of Month, Miles Run, Hours Run (Columns 13, 14, and 15). The figures for these columns are obtained from a Monthly Summary of Equipment Miles and Hours Run (Figure 82), the basis for the entries to this form—which will be discussed in the next chapter—being an Equipment Operator's Daily Report (Figure 93). At present, it is only important to point out that the card provides space for filling in the mileage at the start and finish so that the total number of hours run for the day, as well as the number of hours spent on each job, can be determined. The data are transferred daily from the Equipment Operator's Daily Report to the Monthly Summary of

Equipment Miles and Hours Run. At the end of the month each column is totaled and posted to columns 13, 14, and 15 of each Individual Equipment Record.

An alternative procedure is not to use any summary but to group all Equipment Operator's Daily Reports for the month by equipment number, add up the total miles and hours for a particular piece of equipment, as shown by each card, and enter the total in the proper columns of the Individual Equipment Record.

Cost per Mile and Cost per Hour (Columns 16 and 17). Cost per mile is secured by dividing total cost (column 12) by miles run (column 14), and cost per hour is secured by dividing total cost by hours run (column 15).

Miles per Gallon (Column 18). To secure these figures, it is necessary to divide miles run (column 14) by number of gallons of gasoline used (column 2).

Rentals Earned (Column 19). The figures for this column are arrived at by multiplying the number of miles (column 14) or number of hours (column 15) by a predetermined rental rate established for the piece of equipment (item 14 in upper part of Individual Equipment Record). The predetermined rental rate is arrived at as follows: As indicated previously, the number of miles or hours that each piece of equipment will be operated during a year (or other period) is estimated (see Figure 72, column 16) at the beginning of each year. A similar estimate is made of the cost of operating each piece of equipment. The rate for a piece of equipment then is established by dividing the total estimated cost of operating the piece of equipment by the estimated miles or hours to be run.

Each job is charged by applying the predetermined rate to the number of hours or miles that the piece of equipment was used on it. (See Figures 94 and 95.) Total charges to jobs for a particular piece of equipment during the month should, therefore, equal the amount shown in the "Rentals Earned" column (No. 19) of the Individual Equipment Record.

One reason why a predetermined rental rate is used rather than a charge to each job of actual equipment expenses, is that some of the expenditures, especially overhead items, are not determinable until the end of the month. Another reason is that with a charge to each job the burden would be spread un-

equally. For example, assume that extensive repairs had been made on a truck in March. If the actual cost incurred in that month were charged to jobs, then all jobs on which the equipment was used in March would be charged with the cost of the repairs, whereas jobs on which the equipment was used in several succeeding months would escape such charges.

One of the disadvantages of using a rental rate is that it is based on estimates. If estimates are correct, the amount of earned rentals for each piece of equipment during the period of time covered by the estimate should exactly equal the cost of operating the piece of equipment. In practice, however, because of an overestimate or an underestimate of cost or of the amount of miles or hours run, the amount of earned rentals will be greater or smaller than actual cost. Theoretically, both the charges arising out of the excess of cost over rentals and the credits arising because of the excess of rentals over cost, should be allocated among the various jobs. Usually, however, the difference will not be large enough to warrant the work involved in apportioning. Accordingly, the differences are frequently disposed of by transferring the excess of charges over rentals to the Miscellaneous General Expenses account (801) and the excess of rentals over charges to the credit side of the same account. Where, however, it becomes evident during the year that the rate is too high or too low, the rate may be adjusted so that at the end of the year the rentals will equal the cost of operating the piece of equipment. No entries are, in that event, necessary.

Individual Equipment Record—Summary. Indication has been made thus far not only of how the total cost of operating each piece of equipment is arrived at but also of the manner in which the rentals to be charged for the use of equipment on jobs and activities are determined. In summary, therefore, it is important to note that the total cost of operations from the beginning of the year to the end of any month for all pieces of equipment, as shown by the Individual Equipment Records, must equal the total charges shown in the Transportation Expenses —Clearing account. Again, the sum of the total earned rentals for equipment, as indicated by the Individual Equipment Records, must equal the total credits made to the Transportation Expenses—Clearing account from the beginning of the year, to

FIGURE 83

EQUIPMENT WORK AND COST STATEMENT

Foreman____________________ Period Ending________________193__

Equipment Number	Costs and Expenses						No. Hours Run	Cost per Hour	Number of Miles Run	Cost per Mile	Miles Per Gallon	Rental Earned	
	Operations	Maintenance	Repairs	Depreciation	Garage Overhead	Total						Rate	Amt.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total													

Definition of Costs and Expenses:

Operations:	Gasoline, Oil, Grease, and Supplies
Maintenance:	Maintenance Labor
Repairs:	Mechanics' Labor, Parts, and Outside Repair Services
Depreciation:	Rate per Hour Times Hours Run, or Rate per Mile Times Miles Run
Garage Overhead:	Supervision, Cleaning Shop, Idle Time, Shop Repairs, and General Service.

FIGURE 84 (Front)

EQUIPMENT HISTORY RECORD

Equipment No.________ Motor No.________ Serial No.________

Make________ Type________ Capacity________

Purchased: Date________ Total Purchase Price________ From________

Condition at Purchase________ Econ. Life________ Date Delivered________

Sold: Date________ Trade-in Price $________ To________

Actual Depr. $_____ Actual Hrs. Worked_____ Actual Depr. per Hr. $_____ Actual Miles Run_____ Actual Depr. per Mi. $_____

Total Operation & Maintenance Cost $_____ Total Cost Including Depr. $_____ Cost per Hour $_____ Cost per Mile $_____ Miles per Gal. of Gas_____

Remarks:________

FIGURE 84 (Back)

Year	Inventory at Beginning of Year	Rem. Life in Years	Estimated Salvage Value	Estimated Remaining Depreciation	Estimated Depreciation for Year	Depreciation Rate Per Mile or Hour	Actual Realized Depreciation	Adjustments to Depreciation Charge

Year	Estimated Miles or Hours for Year	Actual Miles for Year	Actual Hours for Year	Difference Actual Mi. or Hr. over or under Estimate	Total Cost for Year	Cost per Mile	Cost per Hour	Miles per Gallon of Gas	License No.

FIGURE 85

EQUIPMENT SERVICE RECORD

EQUIPMENT DIVISION — EQUIP. NO.______

MAKE______ DATE PURCHASED______19___ DEPT.______

TYPE & CAPACITY______ COST $______

FOR THE PERIOD FROM______19___ TO______19___

S P E C I F I E D   F R E Q U E N C Y   O F   A T T E N T I O N

ITEM	WEEKS	MILES	ITEM	WEEKS	MILES	ITEM	WEEKS	MILES
A. CHANGE OIL			E. CHECK ALIGNMENT			I. GREASE CHASSIS		
B. CHECK TIRES			F. GREASE DIFFERENTIAL			J. TUNE MOTOR		
C. CHECK BATTERY			G. GREASE TRANSMISSION			K. HOIST		
D. ADJUST LIGHTS			H. CHECK ANTI-FREEZE			L.		

DATE	MILEAGE	A	B	C	D	E	F	G	H	I	J	K	L	DATE	MILEAGE	A	B	C	D	E	F	G	H	I	J	K	L

date. Similarly, before any adjustments are made to dispose of differences between costs and rentals, the total of the rentals for each piece of equipment must equal the total charges made to jobs for the work done on them by a particular piece of equipment. The method of charging the individual jobs is discussed in Chapter 13.

Statement of Equipment Operations. One of the main purposes of the Individual Equipment Record is to collect all the costs and other pertinent data necessary to the efficient operation of equipment. Efficiency can be determined not only by a careful examination of the data for each piece of equipment but also through comparing the performance of several pieces. Accordingly, a statement should be prepared monthly or quarterly, showing costs and other details of equipment operations (Figure 83). The figures for this statement would be derived primarily from the Individual Equipment Records. (See Figure 71.)

Equipment History Record. Mention has already been made of the Equipment History Record card illustrated in Figure 84, the purpose of this record being to have a permanent history of each piece of equipment. The front part of the card is filled in on the basis of vendor's invoices, vouchers, and personal examination of the equipment. On the other hand, the data called for on the back of the card are derived from the Individual Equipment Records, such data being posted at the end of the year when all the columns have been totaled. The totals for the year and not the individual amounts for each month are posted.

Equipment Service Record. An important record to be used in connection with determining the efficiency of equipment is the Equipment Service Record, illustrated in Figure 85. A separate card is prepared for each piece of equipment, and postings are from the individual Service Request and Job Order forms (Figure 77).

Entries. Except for work performed on equipment by outside firms or persons, the entries charging the Transportation Expense—Clearing account are made at the end of each month. The entry to record the charges for the use of gas, oil, and supplies is as follows:

Transportation Expenses—Clearing (904)......	$5,000	
Materials and Supplies (131)...............		$5,000

An entry in the General Journal to record cost of gas, oil, and supplies used in connection with operation and repair of equipment. SUBSIDIARY ACCOUNTS: *Debit* Materials and Supplies (904.3), $5,000.

The details of the charges are posted to the appropriate columns of each Individual Equipment Record from the Monthly Summary of Gas, Oil, and Supplies Used. The totals of gas, oil, and supplies for all pieces of equipment, as shown by the Monthly Summary of Gas, Oil, and Supplies Used, are posted to the gas, oil, and supplies stock cards respectively.

The entry at the end of the month to record repair parts used is as follows:

Transportation Expenses—Clearing (904)......	$2,000	
Materials and Supplies (131)...............		$2,000

An entry in the General Journal to record parts used in the repair of equipment. SUBSIDIARY ACCOUNTS: *Debit* Materials and Supplies (904.3), $2,000.

Details are posted to each Individual Equipment Record from the Monthly Summary of Repair Parts Used. The credits to repair part stock cards for each part are made from the materials requisitions.

The cost of repair labor is entered upon approval of the payroll. Assuming that a separate payroll is prepared for garage employees, the entry would be:

Transportation Expenses—Clearing (904)......	$3,500	
Vouchers Payable (222)....................		$3,500

An entry in the Voucher Register to record approval of payroll for garage employees. SUBSIDIARY ACCOUNTS: *Debit* Supervision (904.1), $500; Labor (904.2), $3,000.

Postings to the Individual Equipment Record are made only for mechanics' time (i.e., labor expense). The salaries of the equipment superintendent and foreman (i.e., supervision expense) are not posted until the end of the month, when they are allocated, together with other overhead expenses, on the basis of total labor hours put in on each piece of equipment

during the month. No entry is needed in the general records in that connection.

The following is an example of the entry to be made in recording other overhead expenses:

Transportation Expenses—Clearing (904).........	$500	
Operating Expenses (502).....................		$500

An entry in the General Journal to allocate part of cost of power. SUBSIDIARY ACCOUNTS: *Debit* Other Transportation Expenses (904.6), $500. *Credit* Power Transferred (730), $500.

As indicated above, no entries need be made in the general records in connection with the allocation of overhead expenses among the individual pieces of equipment.

Entries for repairs by outside persons or firms are made when bills are vouchered, the entry being:

Transportation Expenses—Clearing (904).........	$200	
Vouchers Payable (222)......................		$200

An entry in the Voucher Register to record cost of repairs to equipment made by outside persons or firms. SUBSIDIARY ACCOUNTS: *Debit* Other Transportation Expenses (904.6), $200.

The expenditures applicable to each piece of equipment are indicated on the voucher. Postings to the appropriate column of the Individual Equipment Record may be made directly from the voucher, or a special voucher distribution sheet may be used for this purpose, depending on the number of postings to be made to each record during the month.

Depreciation charges are recorded at the end of each month as follows:

Transportation Expenses—Clearing (904).........	$500	
Reserve for Depreciation of Utility Plant (250)		$500

An entry in the General Journal to record depreciation on transportation equipment. SUBSIDIARY ACCOUNTS: *Debit* Depreciation (904.5), $500.

The charges to each piece of equipment are, as indicated before, arrived at by multiplying the rate indicated at the top of each Individual Equipment Record by the number of miles or hours run during the month. The above entry is, therefore, based on

the totals of the figures in the "Depreciation" columns (No. 11) of the Individual Equipment Records.

The entry to record the rentals, that is, to reduce the balance of the Transportation Expenses—Clearing account, is also made at the end of each month as follows:

Operating Expenses (502)..................	$ 4,700	
Construction Work in Progress (100.3)......	10,000	
Transportation Expenses—Clearing (905)..		$14,700

An entry in the General Journal to record distribution of transportation expenses among the various jobs and expense accounts.

The entries to the individual work orders are based on the Equipment Operators' Daily Reports, discussed in detail in the next chapter. From the work orders are built up the entries charging the detailed operating expense accounts, the construction work in progress accounts, and the controlling accounts. The credit part of the above entry is based on the total amount of rentals earned, as indicated by the "Rentals Earned" column (No. 19) of the Individual Equipment Records.

As mentioned previously, rentals are based on estimates and may, therefore, be greater or smaller than the total cost of operating the piece of equipment during the year. Assuming it is impractical to reallocate the difference among the various jobs on which the equipment was used, the following entries would be made in order to dispose of under- and overabsorbed transportation expenses:

Operating Expenses (502)......................	$200	
Transportation Expenses—Clearing (905).......		$200

An entry in the General Journal to record disposal of excess of cost of operating equipment over rentals charged to jobs. SUBSIDIARY ACCOUNTS: *Debit* Miscellaneous General Expenses (801), $200.

Transportation Expenses—Clearing (905).........	$250	
Operating Expenses (502)....................		$250

An entry in the General Journal to record disposal of the excess of rentals charged to jobs over cost of operating pieces of equipment. SUBSIDIARY ACCOUNTS: *Credit* Miscellaneous General Expenses (801), $250.

The important facts to be noted about the above two entries are as follows:

1. The first entry represents the net excess of cost over rentals for all pieces of equipment. That is, for some pieces of equipment the charges will be greater than rentals, and for others rentals will be greater than charges. The figures for this entry are arrived at by adding up the excess of cost over rentals for each piece of equipment having such excess, and deducting therefrom the total of the excess of rentals over costs for each piece of equipment containing such excess. The figures for the second entry are arrived at in the same manner except that here it is assumed that the excess of rentals charged over costs is greater than the excess of costs over rentals by the amount indicated in the entry.
2. The "Rentals Earned" column of each record would be adjusted either by deducting from the total rentals an amount representing the excess of rentals over costs for the year, or by adding thereto the excess of costs over rentals.

Laboratory Expenses—Clearing

In this account are recorded all expenses connected with the operation of a central laboratory. Where the laboratory is operated in connection with, and is a part of, the purification division, no clearing account is usually necessary. Frequently, however, a laboratory is used not only for testing the water supply but for conducting other tests as well—for example, the testing of materials purchased. The general procedure in accounting for laboratory expenses is to record both the overhead and the direct expenses connected with the operation of the laboratory.

Some of the direct expenses to be accounted for include the cost of materials and labor. The entry to record the cost of materials used is as follows:

Laboratory Expenses—Clearing (906)..........	$1,500	
Materials and Supplies (131)...............		$1,500

An entry in the General Journal to record issues of materials to laboratory. SUBSIDIARY ACCOUNTS: *Debit* Materials and Supplies (906.3), $1,500.

The credits to the individual stock cards are made daily by the storekeeper or stores office from the stock requisitions. It is assumed that the materials are requisitioned from a central store-

room as needed. If a sub-storeroom is established in the laboratory, the procedure does not differ materially, as is evident from the discussion on page 244.

If the materials used are to be allocated to particular jobs, provision is made on the requisition for showing the work order to which applicable.

The entry to record the cost of labor, assuming a separate payroll is prepared for laboratory employees, is as follows:

Laboratory Expenses—Clearing (906)............	$400	
Vouchers Payable (222)......................		$400

An entry in the Voucher Register to record approval of payroll for salaries and wages of laboratory employees. SUBSIDIARY ACCOUNTS: *Debit* Labor (906.2), $400.

If the cost of labor is to be charged directly to various activities, each employee is provided with a Job Time Card somewhat similar to that illustrated in Figure 67. In that event, the time of the laboratory head and other employees whose salaries and wages cannot be allocated directly to particular jobs is charged to overhead accounts (as, for example, Supervision 906.1).

Other expenses to be taken into account include a proportionate share of the cost of heat, light and power, and depreciation. These expenses are usually apportioned on the basis of floor space occupied by the laboratory. The entry charging such expenses to laboratory operation is as follows:

Laboratory Expenses—Clearing (906)............	$500	
Depreciation (503)..........................		$ 50
Operating Expenses (502)....................		450

An entry in the General Journal to record apportionment of depreciation and a proper share of the cost of heat, light, and power to Laboratory Expenses—Clearing. SUBSIDIARY ACCOUNTS: *Debit* Depreciation (906.5), $500. *Credit* Power Transferred (730), $150; Administrative and General Expenses Transferred (807), $300.

Depreciation on laboratory equipment is recorded as follows:

Laboratory Expenses—Clearing (906)............	$100	
Reserve for Depreciation of Utility Plant (250)		$100

An entry in the General Journal to record depreciation on laboratory equipment. SUBSIDIARY ACCOUNTS: *Debit* Depreciation (906.5), $100.

Postings would also be made to the individual laboratory equipment records.

The entry transferring expenses out of the Laboratory Expenses—Clearing account is as follows:

Operating Expenses (502)........................	$500	
Materials and Supplies (131).....................	100	
Laboratory Expenses—Clearing (907)..........		$600

An entry in the General Journal to record apportioning of laboratory expenses. SUBSIDIARY ACCOUNTS: *Debit* Purification Supplies and Expenses (743), $500.

Postings would also be made to the individual stock cards.

Thus far, the assumption has been that laboratory expenses are to be applied to jobs and activities on the basis of a predetermined rate. Where, however, jobs and activities are to be charged with actual cost, some variation in procedure will be necessary. In all cases, direct expenses would be allocated as incurred. However, two variations in the method of allocating overhead costs are possible. One is to wait until the end of the month, after the total overhead for the month and the total number of labor hours or other units on the basis of which overhead is to be allocated, have been determined. The second is to price jobs immediately after the work is performed, in which case an arbitrary rate to cover overhead expenses must be applied.

If laboratory expenses are allocated to jobs or activities on the basis of a predetermined rental, the amounts charged to such jobs or activities may be either greater or smaller than the total of laboratory expenses incurred. Similarly, where actual costs are allocated directly to jobs or activities but laboratory equipment expenses are applied on the basis of a predetermined rate, the amount of overhead applied may be greater or smaller than actual overhead expenses. Adjustments similar to those described under Stores Expenses—Clearing and Transportation Expenses—Clearing would be necessary in such cases.

Shop Expenses—Clearing

In this account are included all the expenses connected with operating a central shop. The principles involved are the same

as for laboratory expenses, and consequently only a few illustrative entries will be given.

The entry to record the cost of materials used is as follows:

Shop Expenses—Clearing (908)	$400	
Materials and Supplies (131)		$400

An entry in the General Journal to record cost of materials and supplies used. SUBSIDIARY ACCOUNTS: *Debit* Materials and Supplies (908.3), $400.

Postings are also made to the individual stock cards.

The entry to record cost of labor, assuming a separate payroll is prepared for shop employees, is:

Shop Expenses—Clearing (908)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record authorization of payroll for shop employees. SUBSIDIARY ACCOUNTS: *Debit* Labor (908.2), $500.

Overhead expenses are recorded as follows:

Shop Expenses—Clearing (908)	$400	
Operating Expenses (502)		$400

An entry in the General Journal to record shop overhead expenses. SUBSIDIARY ACCOUNTS: *Debit* Other Shop Expenses (908.6), $100; Heat, Light and Power (908.4), $300. *Credit* Administrative and General Expenses Transferred (807), $100; Power Transferred (730), $300.

Shop Expenses—Clearing (908)	$200	
Reserve for Depreciation of Utility Plant (250)		$200

An entry in the General Journal to set up depreciation charges. SUBSIDIARY ACCOUNTS: *Debit* Depreciation (908.5), $200.

Shop expenses are usually charged to jobs and activities on the basis of actual cost rather than on the basis of a predetermined rental. However, if overhead expenses are to be applied to a job before the end of the month, when the total amount of overhead will have been determined, a predetermined overhead rate must be used. Consequently, the amount of overhead expense charged to jobs and activities during the month may be greater or smaller than the total of actual overhead expense for

the month. Adjustments similar to those discussed under Transportation Expenses—Clearing and Laboratory Expenses—Clearing would, in that event, be necessary.

At the end of each month, after the individual jobs have been charged, an entry charging the proper controlling account, and clearing out the shop expenses account, would be made. Assuming that meter repairs are involved, the entry would be:

Operating Expenses (502)	$500	
Shop Expenses—Clearing (909)		$500

An entry in the General Journal to record allocation of shop expenses among various general ledger accounts affected. SUBSIDIARY ACCOUNTS: *Debit* Maintenance of Meters (759.2), $500.

Distribution of Clearing Accounts—Summary

In summary, some points applicable to all clearing accounts will be discussed. In the first place, it should be noted that the classification of accounts has been expanded so as to show the various items of expense which go to make up the clearing accounts. (See page 31.) Small utilities may, however, find that these sub-classifications are too detailed for their purpose and may, therefore, deem it advisable to use only the principal accounts (that is, the account Stores Expenses—Clearing, Transportation Expenses—Clearing, etc.).

Another point worth noting is that provision has been made in the classification for two principal accounts for each group, one showing the total debit postings and the other showing the total credit postings. For example, two principal accounts have been provided for stores expenses: Stores Expenses—Clearing (902) and Stores Expenses—Clearing (Credit) (903). The expenses are cleared out through postings to account 903, and an entry should be made each time a statement is prepared, closing out the balance in account 903 into account 902. For example, assuming that total stores expenses for the month are $10,000, all charged to Stores Expenses—Clearing (902), and that the amount charged to materials withdrawn is $9,500, recorded in the account Stores Expenses—Clearing (Credit) (903), the entry would be:

Stores Expenses—Clearing (Credit) (903).......	$9,500	
Stores Expenses—Clearing (902)...........		$9,500

An entry in the General Journal to record closing of total credits accumulated during period to Stores Expenses—Clearing account (902) and to determine net balance of latter account.

At the end of the year the balance would be adjusted as indicated.

Such was the procedure followed in the illustrative entries given in this chapter. An alternative procedure is not to use the Stores Expenses—Clearing (Credit) account (903), in which event credits would be made directly to the Stores Expenses—Clearing account (902). The advantage in using two principal accounts is that expenses and credits can be accumulated separately.

A third important point to note is the manner in which clearing accounts get on the balance sheet. It was previously stated that the balance in each clearing account should be disposed of at the close of the year. However, the clearing accounts are likely to have balances during the year. Such balances can be considered in the nature of prepaid expenses and would, accordingly, be shown on the balance sheet. The entry to set up such balances on the balance sheet would be:

Clearing Accounts (143)........................	$500	
Stores Expenses—Clearing (902)..............		$500

An entry in the General Journal to record setting up clearing account balances in the balance sheet.

After the statements have been prepared, the above entry would be reversed, the procedure being repeated at each balance sheet date, except at the end of the year. However, if expenses which are properly chargeable to the following year have been included in the clearing account, the procedure at the end of the year would be the same as for balances at the end of the month.

CHAPTER 13

COST ACCOUNTING

Purpose of Cost Accounting

Cost accounting is that method of accounting which provides for the searching out and recording of all the elements of cost incurred in performing an activity, a job, or a unit of work. The purpose of cost accounting is to provide data by means of which the efficiency of operations can be judged, to distribute expenditures among the proper functions, to determine the amount to be charged for jobs performed for outside agencies, and to arrive at the cost of fixed assets. The subject will be treated here rather briefly, the discussion being concerned more with the general principles of cost accounting than with detailed procedure. Procedure will be described only in such detail as is necessary to bring out principles.

Relationship to General Accounting

There is a definite relationship between cost accounting and general accounting. The cost accounts are controlled by controlling accounts either in the General Ledger or in subsidiary ledgers. They may, therefore, be considered as a subdivision of the expenditure accounts and, as such, form a part of the general accounting system. In fact, it is sometimes difficult to determine where the general accounting system ends and the cost accounting system begins. One important factor which must be kept in mind, however, is that the expenditures as shown by cost accounts must be kept in agreement with the respective controlling expenditure accounts in the general and subsidiary ledgers.

Relation of Cost to Work Done

The efficiency of operations can usually be judged best if the relationship between cost and amount of work done is established. Work is usually measured in terms of work units, the cost per unit being determined by dividing total cost applicable to a number of units of work performed, by the number of

units. The procedure is (1) to establish units of work for the activity, (2) to compile all the elements of cost entering into the performance of the work, and (3) to divide the total cost by the number of units in order to arrive at the cost per unit.

Selecting Units of Work

In selecting the unit of work by which to measure efficiency, reference must be had to the type of work performed. The following are some of the activities and the units of measurement used:

Type of Work	*Units of Measurement*
1. Maintenance of Mains	
a. Opening Blowoffs and Flushing Mains	No. of
b. Thawing Main Pipes	No. of
c. Locating Main Pipe Leaks	No. Located
d. Inspecting, Cleaning, and Oiling Main Gates	No. of
e. Emergency Main Shutoffs and Turnons	No. of
f. Repairing Main Pipes	No. of Jobs
g. Lowering Mains	Lineal Feet
h. Repairing Main Gates	No. of Jobs
i. Resetting and Grading Main Gate Boxes	No. of Boxes
j. Other (Specify on daily reports what was done)	
2. Maintenance of Hydrants	
a. Inspecting Hydrants	No. of
b. Flushing Hydrants	No. of
c. Oiling and Packing Hydrants	No. of
d. Thawing, Pickling, and Pumping Hydrants	No. of
e. Painting Hydrants	No. of
f. Inspecting, Cleaning, and Oiling Hydrant Gates	No. of
g. Repairing Hydrants	No. of Jobs
h. Grading and Resetting Hydrant Gate Boxes	No. of
i. Other (Specify on daily reports what was done)	

Type of Work	*Units of Measurement*
3. Maintenance of Services	
a. Repacking and Tightening Service Meter Connections	No. of
b. Cleaning Services (Cellar work)	No. of
c. Thawing Services	No. Thawed
d. Shutoffs and Turnons	No. of
e. Cleaning Service for Stop Boxes	No. of
f. Repairing Services	No. of Jobs
g. Lowering Service Pipes	Lineal Feet
h. Resetting and Grading Service Boxes	No. of
i. Other (Specify on daily reports what was done)	
j. Repairing and Lighting Trenches	No. of
4. Maintenance of Meters	
a. Flushing or Inspecting Meters on Premises	No. of
b. Packing or Cleaning Ground Meter Boxes	No. of
c. Removing or Resetting Meters or Meter Interiors	No. of
d. Other Work on Meters (Specify on daily reports what was done)	
e. Testing Meters	No. of
f. Repairing Meters	No. of
g. Fixing Meter Parts	No. of
h. Other Overhead (Meter Shop Maintenance)	
i. New Meter Parts	
5. Construction of Mains	
a. Excavation	Lineal Feet
b. Laying Pipe	Lineal Feet
c. Backfilling	Lineal Feet
d. Hydrants	No. of
e. Connections	Lineal Feet
f. Other (Moving, Watching, etc.)	

Type of Work	*Units of Measurement*
6. Hydrants	
a. Establishing New Hydrants on Existing Mains	No. of
b. Inserting Hydrant Gates	No. of
c. Replacing Hydrants	No. of
7. Pumping	Millions of Gallons
8. Filtering	Millions of Gallons
9. Transmission and Distribution	Millions of Gallons

Unit Cost Standards

To make full use of the unit costs for administrative purposes, it is necessary to provide some standard by which they may be judged. Accordingly, the development of unit cost standards within a plant is essential to the effective operation of the cost accounting system within the plant. Unit cost standards are usually developed by noting the trend of unit costs for a particular period of time, eliminating from consideration, however, those unit costs which are the result of abnormal operating conditions.

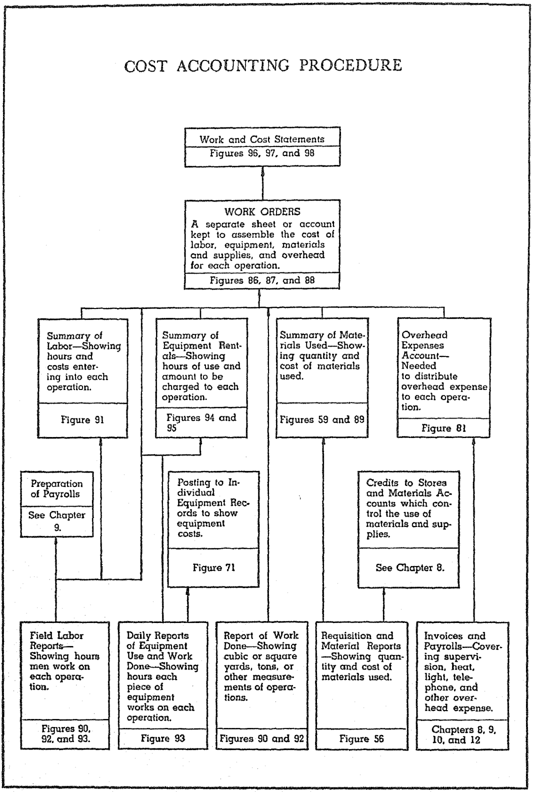
Cost Accounting Procedure

Chart VIII illustrates cost accounting procedure, the reports which are used in connection therewith, and the statements which may be prepared on the basis of these reports. The reports and statements are discussed in this chapter, and except for the explanation of the purpose and use of work orders, the discussion follows the order in which the cost accounting information flows, beginning with the daily reports and ending with the work and cost statements.

Work Orders

A work order is an authorization to perform certain work. Usually, provision is also made for recording all the elements

CHART VIII


COST ACCOUNTING PROCEDURE
Work and Cost Statements
Figures 96, 97, and 98
WORK ORDERS
A separate sheet or account kept to assemble the cost of labor, equipment, materials and supplies, and overhead for each operation.
Figures 86, 87, and 88
Summary of Labor—Showing hours and costs entering into each operation.
Figure 91
Summary of Equipment Rentals—Showing hours of use and amount to be charged to each operation.
Figures 94 and 95
Summary of Materials Used—Showing quantity and cost of materials used.
Figures 59 and 89
Overhead Expenses Account—Needed to distribute overhead expense to each operation.
Figure 81
Preparation of Payrolls
See Chapter 9.
Posting to Individual Equipment Records to show equipment costs.
Figure 71
Credits to Stores and Materials Accounts which control the use of materials and supplies.
See Chapter 8.
Field Labor Reports—Showing hours men work on each operation.
Figures 90, 92, and 93.
Daily Reports of Equipment Use and Work Done—Showing hours each piece of equipment works on each operation.
Figure 93
Report of Work Done—Showing cubic or square yards, tons, or other measurements of operations.
Figures 90 and 92
Requisition and Material Reports—Showing quantity and cost of materials used.
Figure 56
Invoices and Payrolls—Covering supervision, heat, light, telephone, and other overhead expense.
Chapters 8, 9, 10, and 12

of expense which make up the cost of performing the job. These include the cost of materials, labor, equipment use, and overhead.

In discussing the use of work orders, a distinction must be made between three types of jobs: (1) heavy construction jobs which require a relatively long time for their completion and involve considerable expenditure, such, for example, as laying mains and constructing reservoirs, (2) light construction jobs, such as installing service connections, and (3) maintenance work, such as repair and upkeep of reservoirs, distribution equipment, etc. While the procedure in accumulating cost data is not materially different in each case, there are certain variations in procedure which make it advisable to distinguish between heavy construction jobs and others. Therefore, work orders issued for the former type of work will hereafter be referred to as heavy construction work orders, whereas those issued for the latter type of work will be referred to as light construction or maintenance work orders. The variations in procedure will become evident as the discussion proceeds.

Heavy construction work orders, in addition to providing the means whereby costs are accumulated, also carry detailed estimates of the cost of the proposed job, orders not usually being approved unless they carry such estimates. A form for a work order for heavy construction is illustrated in Figure 86.

These orders are usually issued in quadruplicate, one copy going to the foreman, another to the accounting department, a third to the superintendent, and a fourth to the general files. As indicated subsequently, the procedure is to record the cost of materials, labor, and equipment on the basis of reports submitted by foremen. Upon the completion of a job, the foreman turns in one of his copies of the work order, showing the date the job was completed and information pertaining to location of mains, gate valves, etc.

Some variations will be found in practice with respect to recording information on work orders. In some cases, the cost of materials is not recorded until the job is completed, in which event the foreman submits a report of materials used, after which the materials are priced and entered on the work order. Another variation occurs with reference to recording the location of gates, etc. In many utilities a special field clerk makes a

FIGURE 86 (Front)

CONSTRUCTION WORK ORDER

NO. *C 235*

Date________________

TO ________________________________

You are directed to initiate and complete the work described below.

____

____

____

Work to commence__________19__ Work to be completed__________19__

DETAILS OF ESTIMATED COST

Kind of Work	Material	Labor	Equipment	Overhead	Total	No. of Units	Unit Cost
TOTALS							

APPROVED

____

FIGURE 86 (Back)

CONSTRUCTION WORK ORDER

ACCUMULATION OF COSTS

WORK ORDER NO. *C 235* WORK COMPLETED________________19__

Kind of Work	Material	Labor	Equipment	Overhead	Total Cost	Units	Actual Unit Cost	Total Estimated Cost	Excess or Deficiency * of Total Actual Over Estimated Cost	Estimated Unit Cost	Excess or Deficiency * of Actual Unit Cost Over Estimated Cost
TOTALS											
OVER OR UNDER * ESTIMATE											

report of all materials used as well as of the location of the completed line, valves, hydrants, special castings, and of structures of other utilities encountered during the progress of the work. After the cost of materials, labor, and equipment use have been entered, a proper proportion of overhead is applied to the job. The basis on which overhead is applied will be indicated subsequently.

Work orders for light construction and maintenance are somewhat similar to those for heavy construction in that they, too, not only are an authorization to perform the work but also provide the basis for arriving at the cost of performing the job. Examples of a work order for light construction (installation of a service connection) and of a maintenance work order are illustrated in Figures 87 and 88. Both of these forms differ from the work order for heavy construction in that data are posted to them directly instead of being first summarized, as is true in the case of heavy construction orders. The principal difference between the order for light construction and the maintenance work order is that the former is completed in a relatively short period of time, whereas the cost of maintenance work is usually compiled for a monthly period.

A separate light construction work order is issued for each job as needed, materials, labor, and equipment being charged to the order as used. When the job is completed, a proper proportion of overhead is applied thereto and the work order is used as the basis for making entries charging the proper accounts as well as for charging customers for work which is to be done at their expense. A similar procedure is followed in recording costs on maintenance orders, except that overhead expenses are not applied until the end of the month.

Relation of Work Orders to Unit Costs

In order to simplify the discussion, no reference has been made thus far to the method of recording work units on work orders. Usually it is desirable not only to compile the total cost of performing the job but also to judge the efficiency with which the job is performed. As indicated before, although it may not be possible to judge the efficiency with which the job as a whole is constructed, some phases thereof can be judged by keeping a record of the amount of work done and the cost of performing

a certain quantity of work, such quantity being expressed in terms of work units. Provision must, therefore, be made on the work order for showing separately the costs of certain operations together with the number of units to which the cost is to be applied. The unit of work used will, as previously indicated, vary with the type of work. Unit cost is determined by dividing the cost of the job, or any operation connected therewith, by the related number of units. Efficiency can then be judged by comparing the unit cost for the particular operation, as shown on the work order, with a unit cost standard.

Compiling Costs and Units of Work Done

Field labor reports, reports of equipment use, materials reports, and invoices, form the fundamental documents from which both the cost and units of work are derived. Each of these reports, as well as the summaries prepared therefrom, are discussed in detail below. Before proceeding further, however, attention is again called to the fact that not all phases of the work involved in performing a job can be measured in terms of work units. In fact, in the case of some jobs, the aim is merely to get the total cost of the job.

Materials

In discussing the method of compiling the cost of materials, a distinction must be made between heavy construction jobs and other jobs. For light construction and maintenance jobs, material costs are posted from a Materials Issued Register, a form for such summary being illustrated, and the procedure to be followed in posting therefrom described, in Chapter 8. Indication is also made in that chapter of the manner in which materials carried in service trucks are charged to jobs as used.

For heavy construction jobs the procedure varies somewhat, as indicated in Chapter 8. Under one procedure, materials are issued at frequent intervals during the period of construction. The materials are issued on a requisition, but the requisitions are not priced. Instead, the quantities issued are posted from the requisitions to a Summary Report of Materials Used on Heavy Construction Jobs, a form for such summary being illustrated in Figure 89. A separate summary is prepared for each job, and when the job is completed and all unused ma-

FIGURE 87 (Front)

APPLICATION FOR SERVICE CONNECTION AND WORK ORDER

Date.......................... Branch from Box No..........................

Stop Box No......... Amount Paid $..........................

Application by the undersigned is hereby made to connect with the city water mains in...Street, subject to the rules and regulations of the Water Department.

The premises are known as No....................................Street, on the............................side of.................................Street between ....and are described as Lot..................... Block...................in...................................Addition or Subdivision to the City of..

....

Applicant

Business or residence address..

MAIN TO STOP BOX TO BASEMENT

FIGURE 87 (Back)

APPLICATION FOR SERVICE CONNECTION AND WORK ORDER

Size________ Length________ Service No.________

Materials________ Extension No.________

Tap or Extension	Date	Date	Date	Total	Amount	
Stores Requisition No.						
Purchase Order No.						
Daily Labor Report						
Equipment						
Sub-Total						
Overhead						
TOTAL COST						

Amount to be Charged________

Location of Stop Box________

FIGURE 88

MAINTENANCE WORK ORDER

UNIT OF MEASUREMENT ______ TOTAL EST. UNITS ______

ESTIMATED UNIT COST OR UNIT COST STANDARD $ ______

DATE STARTED ______ DATE COMPLETED ______

CONTROL ACCOUNT ______ NO. ______

OPERATION ______ SYMBOL ______

JOB LOCATION ______

EST. COST $ ______ FOR YEAR ENDING ______

	DATE	LABOR		EQUIPMENT		MATERIALS AND SUPPLIES			OVERHEAD	TOTAL COST	WORK UNITS COMPLETED	UNIT COST		
		HOURS	AMOUNT	HOURS	AMOUNT								Per Man Hour	Per Equip. Hour
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

FIGURE 89

SUMMARY REPORT OF MATERIALS USED ON HEAVY CONSTRUCTION JOBS

Job No.................................Job Location and Description...

Date Begun..................................... Date Finished...

Description of Material	Requisition No.	Dates and Quantities Issued Each Date										Total Quantity Issued	Quantity Re-turned	Quantity Used	Unit Price	Stores Expenses—Clear-ing	Total Cost

terials are returned to the stockroom or transferred to another job, the amount of each type of material issued is arrived at, and from that amount the amount returned is deducted. The difference represents the quantity used. This quantity is then priced, a proper proportion of stores expense applied thereto, and the total posted to the work order.

Under another procedure, most of the materials needed for a construction job are issued to the foreman at the inception of the job, and a memorandum record of the amount charged out is made. When the job is completed, the foreman reports the amount of each type of material used and returns the remainder to the stockroom or has it transferred to another job. The report of materials used, as submitted by the foreman, is checked to see to what extent it agrees with the amount issued. Any unused amount must either have been transferred to another job or returned to the stockroom. Discrepancies are carefully investigated. The amount used is priced and entered in a Summary Report of Materials Used on Heavy Construction Jobs similar to that illustrated in Figure 89.

A third procedure is to price requisitions as issued on the construction job. In this event the Summary Report of Materials Used on Heavy Construction Jobs would be expanded to show the number of units issued and the unit price for each type of material issued on each date.

A fourth method sometimes followed is to post information as to materials issued and cost of same directly from the requisition to the work order. Usually, however, so many data are necessary regarding unit prices and the types of materials issued that it is better to summarize the information before posting to the heavy construction work order.

Labor

The procedure to be followed in recording the cost of labor was discussed in Chapter 9. Indication will be made here of how the cost of labor and amount of work done are correlated. As intimated, the method of keeping employees' time will vary according to whether one individual performs a special job or jobs, or whether several individuals are employed on one job. In the former case, a job time ticket is prepared for each employee; and when the cost per unit of labor is desired, provi-

FIGURE 90

DAILY LABOR REPORT—HEAVY CONSTRUCTION JOBS

1		2	3	4	5		6		7		8		9		10	
Daily Report—Construction Work Foreman________ Date________		Total Hours	Rates of Pay	Total Amount	*(Further details as to location of job, etc.)*											
Give Location of Construction Work Here Work Order No.________ St.________																
(Main Construction Only—Operations)					Excavation		Laying Pipe		Back-filling		Hydrants		Connections		Other	
Measurement of Work Completed	Work Unit															
	Quan. Comp.															
Pay. No.	Name				Hrs.	$ Amt.	Hrs.	$ Amt.	Hrs.	$ Amt.	Hrs.	$ Amt.	Hrs.	$ Amt.	Hrs.	$ Amt.
	Total															

sion is made on this ticket for accumulating the number of work units involved. A form for such a ticket is illustrated in Figure 67.

Where a group of men works on a single job, daily gang labor reports are used, a separate report being prepared for each gang of men, one report covering one job or several, depending on the nature of the work. Forms of gang labor time reports are

FIGURE 91

MONTHLY SUMMARY OF UNIT AND LABOR COSTS

For Month Ending__________

Location and Description of Job__________

__________Work Order No.______

Operations	EXCAVATION			LAYING PIPE					
Work Unit									
Date	No. of Units	No. of Hours	$ Amt.	No. of Units	No. of Hours	$ Amt.	No. of Units	No. of Hours	$ Amt.

shown in Figures 90 and 92. Between these two forms there is not much variation, the main difference being that the first form is assumed to cover one job only, whereas the second can be used in reporting the cost of several jobs.

The form illustrated in Figure 90 is assumed to cover a heavy construction project. It is filled out each day by the foreman, who inserts all the information called for, except names of employees, total hours put in, rates of pay, total amount of pay, and cost of labor of each employee for each operation, which information is filled in daily at the cost accounting office when the foreman's report is turned in. The totals are then posted to a Monthly Summary of Unit and Labor Costs (Figure

FIGURE 92

DAILY LABOR REPORT—LIGHT CONSTRUCTION AND MAINTENANCE WORK

Foreman____________________
Date____________________

Foreman					Description and Location of Job								
Date													
Work Order No.													
Work Units (Where Applicable)													
Quantity Completed (Where Applicable)													
Job Completed													
Payroll Number	Name	Hours	Rate per Hour	$ Amount	Hrs.	$ Amount	Hrs.	$ Amount	Hrs.	$ Amount	Hrs.	$ Amount	
	TOTAL												

FIGURE 93

EQUIPMENT OPERATOR'S DAILY REPORT

Date________________19__

Description of Equipment________________ Equipment Number________ Rate________

Operator________________ Pay. No.______ Rate______ Mileage at finish________

Helper________________ Pay. No.______ Rate______ Mileage at start________

Signature of Foreman________________________ Miles for day________

No.	KIND OF WORK			Equipment Time		Operator Time		(*Office*) Job or Oper. No.
	Description of Material	Hauled from	Hauled to	Hours	$ Amount	Hours	$ Amount	
			TOTAL					

91), a separate sheet being provided for each job. After the totals have been posted to the summary, the reports are transmitted to the payroll clerk and used in preparing the payroll.

Figure 92 illustrates a form suitable for small construction jobs and maintenance work. The procedure in filling out this form is similar to that followed in filling out the form illustrated in Figure 90. Since service connections may be chargeable to owners, however, it is important that indication be made at the top of each column whenever the cost of the job is chargeable to an owner.

Equipment Use

In accordance with the discussion in Chapter 12, it is assumed that jobs are charged for use of equipment on the basis of a predetermined rental. The data for charging each job and operation are accumulated in an Equipment Operator's Daily Report (Figure 93). This report is submitted daily to the cost accounting office, where rental rates for equipment and rates of pay for drivers are entered. The number of hours shown in the "Equipment Time" column for each job and operation is multiplied by the rental rate to arrive at the cost of equipment use chargeable. The number of hours shown in the "Operator Time" column for each job or operation is multiplied by the rate for each operator in order to arrive at operator cost. The data are then posted to a Summary of Equipment Charges. A separate summary, similar to that illustrated in Figure 94, is prepared for each heavy construction job. For other jobs a summary similar to that shown in Figure 95 is used.

Provision is frequently made, also, for showing on the Equipment Operator's Daily Report the total amount payable to operators. This amount is arrived at by multiplying the total number of hours worked by each driver by his rate of pay. The accuracy of the total of the amounts shown in the "Operator Time" column can then be proved by noting whether it is in agreement with the amount of pay shown as due drivers. Adjustment is usually made in the number of operator hours for time spent going from and to garage.

As indicated in the previous chapter, these reports are also used for posting to a Summary of Equipment Costs. After such postings have been made, the reports are transmitted to the

FIGURE 94

SUMMARY OF EQUIPMENT CHARGES TO HEAVY CONSTRUCTION JOBS

Work Order No.__________ For Month Ending__________

Location and Description of Work____________________

Date	Equipment No.	OPERATION (*Name*)				OPERATION (*Name*)				Total Rentals	Total Operator Cost	Total Cost
		Equipment Hours	Equipment Cost	Operator Hours	Operator Cost	Equipment Hours	Equipment Cost	Operator Hours	Operator Cost			

FIGURE 95

SUMMARY OF EQUIPMENT CHARGES TO LIGHT CONSTRUCTION AND TO MAINTENANCE JOBS

For Month Ending__________

Date	Equipment No.	Work Order No.	OPERATION (*Name*)				OPERATION (*Name*)				Total Rentals	Total Operator Cost	Total Cost
			Equipment Hours	Equipment Cost	Operator Hours	Operator Cost	Equipment Hours	Equipment Cost	Operator Hours	Operator Cost			

payroll office, where they are used in preparing the payroll. They are then returned to the cost accounting office, where they are filed by equipment number.

Overhead

Thus far, those expenses have been considered which can be allocated directly to jobs. But, as indicated in the preceding chapter, there are certain expenses which cannot be directly allocated and must, therefore, be prorated on some arbitrary basis. Two methods of procedure are possible.

CHART IX

METHOD OF ALLOCATING OVERHEAD ON VARIOUS BASES

Overhead for Month—$10,000

Basis of Apportioning Overhead	Total for Month	Rate	Total for Job No. 100	Overhead to be Charged to Job No. 100
Labor Hours	100,000 hrs.	.10	5,000 hrs.	$ 500
Cost of Labor	$ 50,000	.20	$2,800	560
Cost of Materials	30,000	.33⅓	1,600	533
Cost of Materials and Labor	80,000	.125	4,400	550
Cost of Materials, Labor, and Overhead	92,000	.11	5,100	561

One is to wait until the end of the month, when the total amount of overhead will have been determined; actual overhead would then be distributed among jobs and operations on the basis of some factor common to all. Examples of such factors are: the number of labor hours, the cost of labor, the cost of materials, the cost of materials and labor, or the cost of materials, labor, and equipment. Chart IX illustrates this method of allocating overhead cost, but no particular meaning should be attached to the numbers used in the illustration because they are fictitious and are not intended to show that the overhead allocated on one basis is greater or smaller than that on another basis. Whether the amount allocated will be greater or smaller under one method or another will depend on the proportion that each element of cost, that is, cost of materials, labor, or equipment use, constitutes of the total expense of performing the activity or job.

The other method of procedure is to use any of the above

factors as a basis of apportioning overhead but to employ estimated, rather than actual, rates. The procedure is first to estimate the total amount of overhead which will be incurred and then to estimate the number of labor hours, total cost of labor, total cost of material, or any of the other factors among which total overhead is to be distributed. The rate is found by dividing the total estimated overhead by either the total estimated number of labor hours, total estimated cost of materials, or any of the other bases just mentioned. Cost is allocated to a particular job or activity by multiplying the actual number of labor hours worked on the job, etc., by the predetermined rate.

The amount of overhead or the number of units on which it is to be prorated may be overestimated or underestimated so that actual overhead may either not be completely absorbed or may be overabsorbed. The procedure in disposing of the difference is discussed in the preceding chapter.

Which basis to use is a matter to be determined in the light of existing conditions. No general rule can be laid down except to state that the basis of distribution should be such as will apportion the overhead among the jobs and activities roughly in proportion to the extent to which they were responsible for such overhead expenses. In general, where labor plays a predominant part in operation, the number of labor hours is used as a basis; where materials play the predominant part, the cost of materials may be taken as a basis for distribution; and where materials and labor both play an important part, the cost of both may be used. Frequently, the total direct cost, that is, the cost of materials, labor, and equipment, is employed. Labor hours, however, are more likely to be used for the distribution of overhead among activities involving maintenance since labor cost plays a predominant part in such activity. For construction work, on the other hand, especially large construction jobs where both materials and labor play a predominant part, the cost of both materials and labor—and frequently, also, of equipment expense—is likely to be used.

Statements

For heavy construction jobs two statements are advisable. A separate one might be prepared for each job completed during

FIGURE 96

CONSTRUCTION WORK AND COST

Job No.__________ Location__________

Type of Work__________ Date Started__________

			Actual Costs					Total Costs		
Operation Symbol	Operation	Unit of Measure	Labor	Hired Equipment	City Equipment	Materials	Overhead	Actual	Estimate	Actual Over or Under* Estimate
1	2	3	4	5	6	7	8	9	10	11

Continued on next page.

FIGURE 96 (Continued)

STATEMENT—COMPLETED JOBS

Date of Report____________________

Date Completed____________________

Continued from preceding page.

Units Completed			Unit Costs			Units Per	
Actual	Estimate	Actual Over or Under* Estimate	Actual	Estimate	Actual Over or Under* Estimate	Labor Hour	Equipment Hour
12	13	14	15	16	17	18	19

the month, showing the actual and estimated unit cost of those operations involved in performing the job which can be expressed in terms of units (Figure 96). In addition, a summary statement showing the estimated and actual cost of each job completed during the month (Figure 97) is advisable.

For all other work susceptible to unit cost measurement, the statement illustrated in Figure 98 should be prepared.

FIGURE 97

MONTHLY SUMMARY OF COMPLETED CONSTRUCTION

For Month Ending____________________

Job Number	Location and Description of Job	Total Estimated Cost for Job	Actual Cost	Actual Cost Over or Under * Estimated Cost
1	2	3	4	5

It should be noted that the information for the first two statements is compiled from the work orders, that information for the data shown in the "Current Month" columns of the third statement are also derived from work orders, and that data for previous months or years are obtained from past reports.

Entries

The entries to record the cost of materials, labor, and equipment use have been illustrated in Chapters 8, 9, and 12 respectively. Overhead expenses will have been recorded as incurred. At the end of each month, after all the overhead expenses have been allocated, an entry will be made crediting the appropriate accounts in which the overhead expenses have first been recorded as incurred and debiting the operating expense or

FIGURE 98

MONTHLY REPORT OF OPERATION COSTS

For Month of____________________

Operation	Standard Work Units	UNITS OF WORK DONE				UNIT COST				TOTAL COST				PRODUCTION RATIOS	
		Last Month	This Month	Last Year to Date	This Year to Date	Last Month	This Month	Last Year to Date	This Year to Date	Last Month	This Month	Last Year to Date	This Year to Date	Units per Labor Hour	Units per Equipment Hour

asset accounts to which applicable. The entry will be as follows:

Construction Work in Progress (100.3).........	$1,000	
Operating Expenses (502)....................	400	
Operating Expenses (502)..................		$1,400

An entry in the General Journal to record apportionment of overhead expenses. SUBSIDIARY ACCOUNTS: *Debit* Maintenance of Reservoirs (705.1), $200; Maintenance of Services (759.1), $200. *Credit* Power Transferred (730), $500; Administrative and General Expenses Transferred (807), $900.

The above entry is based on a summary of the details contained on the individual work orders. Postings to the individual operating expense accounts affected would be made directly from work orders.

Part IV

ACCOUNTING FOR ASSETS, LIABILITIES, AND NET WORTH

CHAPTER 14

ACCOUNTING FOR CASH

Safeguarding Cash

Since cash is one of the most liquid assets, great care must be taken to establish a proper procedure for its handling. Three safeguards stand out particularly in this connection. The first, as was described in Chapter 2, is provision by the utility for a proper system of internal check. The second is the establishment of the imprest system of handling cash, under which system all cash receipts are deposited intact in the bank, and all payments, except for some small amounts handled through a petty cash fund, are made by check, thus reducing the rehandling of cash to a minimum. The third safeguard is an adequate audit by outside accountants at regular intervals.

Although it is highly important to minimize the possibility of defalcation, provision must also be made for reducing the loss to the utility should a defalcation occur. This can be accomplished best by bonding all employees handling cash or securities.

Accounting for Cash Receipts

Collections on customers' accounts represent the most important cash receipts of a utility. The procedure in accounting for such receipts was discussed in part in Chapter 6. Other details will be given in this chapter, the procedure in accounting for cash received from customers in person being discussed first, after which will follow a discussion relating to the handling of remittances by mail.

Handling Payments Made by Customers in Person. An adequate number of cashiers should be assigned to handle collections. Each cashier should have a separate cage and should be provided with all the office equipment essential to handling collections, such as a change machine, rubber stamps, and a cash register or change drawer. No cashier should accept any payment unless it is accompanied by a bill, and provision should be made for issuing duplicate bills speedily. So long as cashiers'

cages remain open for the acceptance of payments, it should be possible for a customer to obtain a duplicate bill. The work may be expedited, however, if the duty of making out duplicate bills is not assigned to the cashiers but to an information, or other, clerk.

It may be desirable for the convenience of the public to hold the cashiers' cages open for longer than the usual period on certain days. If this is done, the extra work should be rotated among the cashiers, if there is more than one.

Where machine cash registers are employed, the amount received is recorded on the register and is printed on both the portion of the bill to be kept by the customer and the cashier's stub. The stub is often automatically routed to a closed drawer which can be opened only by a representative of the accounting department. Frequently, too, machines carry locked inside them a tape on which each payment is recorded, only representatives of the accounting department usually having access to such tape. Moreover, some machines are constructed so that it is possible through the use of proper keys to secure totals by meter readers' districts at any time desired.

Remittances Received by Mail. The procedure in accounting for remittances received through the mail will not vary materially from handling payments made at cashiers' cages. As indicated before, all mail should be opened by a responsible employee, and it should be the duty of such person to note whether each check is accompanied by a bill. If no bill is enclosed, he should secure a duplicate bill. Furthermore, it is advisable to have the route or bill number recorded on the check before the check and the bill are turned over to the cashier. The remainder of the procedure is the same as for collections at cashiers' cages.

Reporting Cash Receipts. Cashiers should be required to turn over to the head cashier each day the amount collected during that day. A report should accompany collections, and the total of receipts, as shown by the report, must agree with the total of collections turned in. The detailed procedure whereby the stubs are used in determining that each cashier has reported the full amount of cash received, as evidenced by the stubs, is discussed in Chapter 6.

The head cashier should make a recapitulation of the day's

total receipts, based on the individual reports submitted by each cashier. This recapitulation should be in multiple, one copy to be retained in the cashier's office, and another sent, with the cashier's receipt portion of each bill collected, to the customer accounting office. Where a utility uses a cash register with a locked drawer into which the cashier's portion of the bill is automatically routed, a representative of the customer accounting department should remove the coupons from the register drawers and, where a locked tape is used, also the locked tape.

Depositing Cash Receipts. All receipts should be deposited the day after collection to the credit of the utility. A deposit slip should be made out and transmitted to the bank with the deposits and a pass book. If no pass book is used, the deposit slip should be made out in duplicate; and, in the case of municipal utilities, an additional deposit slip is frequently made out for transmission to the city auditor.

Accounting for Cash Disbursements

As indicated, practically all payments should be made by check. There are, however, a few instances where it is essential to make disbursements in cash. Examples of such instances are for making change and for the disbursements of small amounts, such as those for the purchase of stamps, payment of postage due, and messenger service. To permit the full deposit of all money collected, it is desirable to set aside a sum of money from which to make change. Such sum should remain the same until an increase or decrease in the volume of business, or other factors, make necessary an adjustment. The exact procedure in establishing the fund is to make out a check for the proper amount, which check is cashed by the cashier, the money thereby obtained being used in making change. In reporting receipts for the day, the cashier must make certain that he has deducted from the total cash on hand at the close of the day the amount representing change funds.

In order to take care of small cash payments for which it would be impractical to issue a check, a petty cash fund should be established. The procedure in establishing such fund is as follows: A check is made out for the sum desired and placed with the person in charge of petty cash disbursements. This person

will usually be either one of the cashiers or some general office employee. The petty cash fund cashier then cashes the check and is thereafter responsible for the money thus placed in his, or her, custody. A record must be kept of all disbursements from the fund, and to facilitate the recording of such disbursements, it is advisable to use uniform petty cash receipts (Figure 99), a receipt being filled out each time a disbursement is made. The amount in the fund plus the total of disbursements, as

FIGURE 99

PETTY CASH RECEIPT

$.......................... Date..

Received...

For...

Signed..

Charge Account No................ O.K.........................

indicated by the filled out receipt forms, should at all times equal the amount originally placed in the fund.

The amount to be set aside for the fund will vary with the magnitude of petty cash disbursements. When the balance of the fund becomes low, it is replenished. The procedure is somewhat as follows: An analysis is made of the expenditures covered by the petty cash disbursements, some utilities providing for the daily analysis of such disbursements through the use of a Petty Cash Journal (Figure 100), in which case it is necessary only to add up each column to arrive at the total of expenditures. A voucher covering the total amount of petty cash disbursements is prepared and recorded in the Voucher Register, the expenditures covered by the petty cash disbursements thus finding their way into the records. A check is then drawn for the amount of the voucher and transmitted to the petty cash fund cashier, who cashes it and places the proceeds with the unexpended portion of the petty cash fund.

Since disbursements made out of the petty cash fund are not

recorded as expenditures until the fund is reimbursed, it is important that the fund be replenished prior to the preparation of financial statements, even if, at that time, the fund has a sufficient balance to meet expenditures for some time to come. Unless this is done, some of the expenditures will not be recorded as of the period to which they apply.

Banks and Bank Accounts

The number of banks to handle the utility's accounts will vary with the size of the utility. Such factors as convenience, diversification of risk, fiduciary responsibility, and the bank's

FIGURE 100

PETTY CASH JOURNAL

From__________ To__________ Voucher Number__________

No.	Account	Amount					

general policy, must be taken into account. In the case of municipal utilities, the law usually requires the furnishing of collateral by the bank for the security of deposits, in which event it is important to see that proper collateral is supplied and that the provisions of the law are otherwise complied with.

The number of accounts to be maintained in a bank will depend on the extent to which it is desired to set aside cash for particular purposes. Where the number of special funds maintained by the utility is not great, it may be advisable to set up a separate account for each fund. Separate bank accounts, for example, might be established for interest and bond retirement funds, for construction funds, and for money representing customers' deposits. Similarly, a separate account might be established for handling payrolls. All other funds would be handled through one general bank account. Where a municipal utility's funds are in the custody of city officials, a bank account,

will usually be either one of the cashiers or some general office employee. The petty cash fund cashier then cashes the check and is thereafter responsible for the money thus placed in his, or her, custody. A record must be kept of all disbursements from the fund, and to facilitate the recording of such disbursements, it is advisable to use uniform petty cash receipts (Figure 99), a receipt being filled out each time a disbursement is made. The amount in the fund plus the total of disbursements, as indicated by the filled out receipt forms, should at all times equal the amount originally placed in the fund.

FIGURE 99

PETTY CASH RECEIPT

$................................ Date..

Received..

For...

Signed..

Charge Account No.................. O.K...........................

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or accounts, separate from those of the municipality's general bank accounts, should be used. The account, or group of accounts, should be employed only for depositing the receipts of, and making disbursements for, the utility.

Reconciling Bank Accounts with Cash per Books

A separate statement covering each bank account is normally submitted by the bank at the end of the month. Each statement shows the balance of the account at the beginning of the month, deposits made during the month, bank credits, charges not evidenced by checks, and the balance to the credit of the account at the end of the month. Canceled checks and bank slips evidencing bank debits and credits accompany the statements. The first thing to do upon receipt of the statements is to check the canceled checks against the amounts shown in the bank statement, at the same time examining each check for signatures and endorsements. Furthermore, each credit or charge slip should also be examined to see that the full amount of credit is received and that proper charges are made.

The balance of cash, as shown by the Cash account in the General Ledger, will usually not agree with the balance shown on the bank statement for the following reasons. As soon as the utility issues a check, the amount thereof is recorded as a disbursement, that is, as a reduction of the cash balance. The bank, on the other hand, will not reduce the balance to the credit of the depositor's account until the check clears; and since, ordinarily, many of the checks issued towards the end of the month do not clear until the following month, the balance of cash shown by the bank will be greater than that indicated by the Cash account in the General Ledger. Other differences result from credits or charges made by the bank of which the utility has not been informed. Again, cash may be held for deposit but not yet have been deposited.

To determine whether the amount of cash as indicated by the records and by the bank is correct, a bank reconciliation statement is prepared. In this statement cognizance is taken of the charges and credits made by the bank and not recorded, as well as of cash receipts and disbursements recorded by the utility but not shown on the bank statement. The following reconciliation statement is based on the assumption that the books have been

kept open sufficiently long after the close of the month to record bank credits and bank charges in the utility's books. Only two items are, therefore, involved in the reconciliation, namely, unrecorded deposits and outstanding checks.

STATEMENT OF RECONCILIATION OF BANK ACCOUNT "A"
FIRST NATIONAL BANK
June 30, 1939

Balance per Bank Statement		$10,000
Add—Credits Recorded by Utility and not by Bank— Unrecorded Deposit		2,000
		$12,000
Less—Charges Recorded by Utility and not by Bank— Checks Outstanding:		
#1241	$1,000	
#1242	300	
#1245	100	
#1248	800	
#1249	200	2,400
Balance per General Ledger		$ 9,600

An alternative form of bank reconciliation statement is presented below. The only difference between the two statements is that in the one illustrated below the balance of the general ledger Cash account is reconciled with the balance per bank statement instead of vice versa, as is true with the first statement.

STATEMENT OF RECONCILIATION OF BANK ACCOUNT "A"
FIRST NATIONAL BANK
June 30, 1939

Balance per General Ledger		$ 9,600
Deduct—Credits Recorded by Utility and not by Bank— Unrecorded Deposit		2,000
		$ 7,600
Add—Charges Recorded by Utility and not by Bank— Checks Outstanding:		
#1241	$1,000	
#1242	300	
#1245	100	
#1248	800	
#1249	200	2,400
Balance per Bank Statement		$10,000

It is evident from the above two schedules that the reconciliation can be made by starting either with the balance per bank statement or with the balance per books. Another important point to remember is that where numerous checks are outstanding, it is not necessary to list them on the reconciliation statement. They may be listed by number and amount on a tape, which should be attached to the reconciliation statement, only the total being shown on the statement. The tape is used again at the beginning of the following month to determine whether all checks outstanding have cleared; checks listed on this tape which have not cleared should be shown first on the new tape, or, if a tape is not used, in the reconciliation statement.

Entries

The entries for receipts on customers' accounts were illustrated in Chapter 6. Other sources of receipts are the sale of assets, receipts from borrowings, and interest revenues. Entries for these as well as entries relating to disbursements are illustrated throughout the manual. Accordingly, the entries in this chapter are intended to illustrate primarily the procedure in accounting for change funds, petty cash funds, and special deposits, such as those established for the purpose of retiring matured bonds or of paying interest on bonds.

Change Funds. The establishment of a change fund involves the transfer of money from a general cash account to a special account, the entry being as follows:

Change Fund (122.1)	$500	
Vouchers Payable (222)		$500
An entry in the Voucher Register to record authorization for establishment of a change fund.		
Vouchers Payable (222)	$500	
Cash (120)		$500
An entry in the Check Register to record payment of voucher.		

The entry increasing the amount of the fund is similar to that just illustrated. A decrease is recorded as follows:

Cash (120)	$100	
Change Fund (122.1)		$100
An entry in the Cash Receipts Register to record reduction of change fund.		

Petty Cash Fund. The two principal entries involved in accounting for petty cash are the entry setting up the fund and that replenishing the fund. The entry to set up a petty cash fund is:

Petty Cash (122.2)	\$50	
Vouchers Payable (222)		\$50
An entry in the Voucher Register to record the establishment of a petty cash fund.		
Vouchers Payable (222)	\$50	
Cash (120)		\$50
An entry in the Check Register to record payment of voucher.		

As was indicated previously, prior to replenishing the petty cash fund, an analysis of petty cash disbursements is made to determine the expenditure accounts to which applicable. On the basis of this analysis, the specific expenditure accounts are charged. The entry is:

Operating Expenses (502)	\$40.30	
Vouchers Payable (222)		\$40.30
An entry in the Voucher Register to distribute expenditures represented by petty cash payments and to provide for the replenishment of the petty cash fund. SUBSIDIARY ACCOUNTS: *Debit* General Office Supplies and Expenses (793), \$40.30.		

A check is then made out for the amount disbursed, after which the check is cashed and the proceeds placed with the unexpended money of the petty cash fund. The entry is as follows:

Vouchers Payable (222)	\$40.30	
Cash (120)		\$40.30
An entry in the Check Register to record payment of voucher.		

Special Deposits. Special deposits are frequently made in connection with the payment of interest coupons and matured bonds. The reason for establishing such deposits is usually the desirability of making bonds and interest payable through a fiscal agent in some large financial center. Such a provision helps in making the bonds more marketable.

The procedure in establishing such a deposit account is some-

what as follows: A bank or trust company is selected to act as agent, and an agreement is reached as to commissions, dates of rendering statements, dates of transmitting money to agents, and similar matters. A few days before the bonds mature or interest becomes payable, the money is transmitted to the fiscal agent. The fiscal agent then pays bonds and interest coupons as presented; and at certain regular intervals he transmits a report of the bonds and coupons paid (Figure 101). This report is accompanied by bonds and coupons turned in.

FIGURE 101

REPORT FROM FISCAL AGENT

Date________________

Title of Issue	Bonds Paid		Coupons Paid		Total Paid
	Quantity*	Amount	Quantity*	Amount	

* Note: If fiscal agent is required to itemize bonds and coupons by numbers, the word "Numbers" should be substituted for "Quantity."

When the money is transmitted to the fiscal agent, the following entry is made:

Cash with Fiscal Agent (121.1).............	$50,000	
Vouchers Payable (222).................		$50,000
An entry in the Voucher Register to record authorization to make special deposit with fiscal agent.		
Vouchers Payable (222)..................	$50,000	
Cash (120)............................		$50,000
An entry in the Check Register to record payment of voucher.		

The next entry is made when the report is received from the fiscal agent, and—assuming that \$10,000 interest and \$30,000 bonds have been paid—it would be as follows:

Interest on Long-Term Debt (530)...........	\$10,000	
Bonds (210).............................	30,000	
Cash with Fiscal Agent (121.1)...........		\$40,000

An entry in the General Journal to record payment of interest and retirement of debt by fiscal agent.

CHAPTER 15

RESTRICTED FUNDS

Introduction

Restricted funds are those set aside for some special purpose and restricted to the use of that purpose unless directed otherwise by those authorized to act. This segregation of assets may be voluntary or in compliance with the provisions of a contract. In either case, the restricted fund is normally established through the transfer of cash from the general funds of the utility to a special fund. When the funds are to be held for a long period of time, they are usually invested in income bearing securities and administered by the utility or by a trustee. In the case of a private water utility, a trust company commonly acts as trustee; whereas for municipal utilities, a sinking fund board, consisting of utility and other city officials, is designated as trustee.

As indicated in Chapter 14, a distinction must be made between funds and special deposits, the distinction being one of degree rather than kind. Special deposits, for example, are usually established for a much shorter period of time, examples of such, as well as of the entries involved in accounting for the same, being given in the chapter mentioned above. Some of the more common restricted funds are sinking funds and construction funds.

SINKING FUNDS

Nature and Purpose of a Sinking Fund

A sinking fund is one set up for the accumulation of resources to be used in retiring term bonds. Although the primary purpose of a sinking fund is to insure payment of obligations at their maturity, it also provides additional security to the holder of the obligations if the assets provided with the proceeds of the obligations should shrink in value because of depreciation. If a bond indenture, in addition to requiring a sinking fund, also requires that there be an appropriation of earnings in the

TABLE 5 [1]

Amount which must be contributed periodically to a sinking fund so that the total contributions, plus compounded earnings at a specific rate of interest, will equal $1.00 at the end of a varying number of periods.

Periods	1½%	1¾%	2%	3%	3½%	4%
1	$1.0000000	$1.0000000	$1.0000000	$1.0000000	$1.0000000	$1.0000000
2	0.4962779	0.4956630	0.4950495	0.4926108	0.4914005	0.4901961
3	0.3283830	0.3275675	0.3267547	0.3235304	0.3219342	0.3203485
4	0.2444448	0.2435324	0.2426238	0.2390271	0.2372511	0.2354901
5	0.1940893	0.1931214	0.1921584	0.1883546	0.1864814	0.1846271
6	0.1605252	0.1595226	0.1585258	0.1545975	0.1526682	0.1507619
7	0.1365562	0.1355306	0.1345120	0.1305064	0.1285445	0.1266096
8	0.1185840	0.1175429	0.1165098	0.1124564	0.1104767	0.1085278
9	0.1046098	0.1035581	0.1025154	0.0984339	0.0964460	0.0944930
10	0.0934342	0.0923753	0.0913265	0.0872305	0.0852414	0.0832909
11	0.0842938	0.0832304	0.0821779	0.0780775	0.0760920	0.0741490
12	0.0766800	0.0756138	0.0745596	0.0704621	0.0684840	0.0665522
13	0.0702404	0.0691728	0.0681184	0.0640295	0.0620616	0.0601437
14	0.0647233	0.0636556	0.0626020	0.0585263	0.0565707	0.0546690
15	0.0599444	0.0588774	0.0578255	0.0537666	0.0518251	0.0499411
16	0.0557651	0.0546996	0.0536501	0.0496109	0.0476848	0.0458200
17	0.0520797	0.0510162	0.0499698	0.0459525	0.0440431	0.0421985
18	0.0488058	0.0477449	0.0467021	0.0427087	0.0408168	0.0389933
19	0.0458785	0.0448206	0.0437818	0.0398139	0.0379403	0.0361386
20	0.0432457	0.0421912	0.0411567	0.0372157	0.0353611	0.0335818
21	0.0408655	0.0398146	0.0387848	0.0348718	0.0330366	0.0312801
22	0.0387033	0.0376564	0.0366314	0.0327474	0.0309321	0.0291988
23	0.0367308	0.0356878	0.0346681	0.0308139	0.0290188	0.0273091
24	0.0349241	0.0338857	0.0328711	0.0290474	0.0272728	0.0255868
25	0.0332635	0.0322295	0.0312204	0.0274279	0.0256740	0.0240120
26	0.0317320	0.0307027	0.0296992	0.0259383	0.0242054	0.0225674
27	0.0303153	0.0292908	0.0282931	0.0245642	0.0228524	0.0212385
28	0.0290011	0.0279815	0.0269897	0.0232932	0.0216027	0.0200130
29	0.0277788	0.0267642	0.0257784	0.0221147	0.0204454	0.0188799
30	0.0266392	0.0256298	0.0246499	0.0210193	0.0193713	0.0178301
31	0.0255743	0.0245701	0.0235964	0.0199989	0.0183724	0.0168554
32	0.0245771	0.0235781	0.0226106	0.0190466	0.0174415	0.0159486
33	0.0236414	0.0226478	0.0216865	0.0181561	0.0165724	0.0151036
34	0.0227619	0.0217736	0.0208187	0.0173220	0.0157597	0.0143148
35	0.0219336	0.0209508	0.0200022	0.0165393	0.0149984	0.0135773
36	0.0211524	0.0201751	0.0192329	0.0158038	0.0142842	0.0128869
37	0.0204144	0.0194426	0.0185068	0.0151116	0.0136133	0.0122396
38	0.0197161	0.0187499	0.0178206	0.0144593	0.0129821	0.0116319
39	0.0190546	0.0180940	0.0171711	0.0138439	0.0123878	0.0110608
40	0.0184271	0.0174721	0.0165558	0.0132624	0.0118273	0.0105235

[1] Adapted from Laurence I. Hewes and James W. Glover, *Highway Bonds*, Bulletin No. 136, U. S. Dept. of Agriculture, Washington, 1917, pp. 64–65. The table is based on the assumption that interest is compounded as often as contributions are made. Thus it is assumed that if contributions are made annually, interest will be compounded annually, that if contributions are made semi-annually, interest will be compounded semi-annually, etc. If, therefore, the contribution and compounding periods are not the same, a slight inaccuracy results. This would be true, for example, in the case of contributions made annually and interest compounded semi-annually.

amount of the periodic deposit in the fund, this added feature has the effect of requiring a substitution of ownership equity for the creditor equity represented by the bonds.

In setting up a sinking fund, the aim is not only to provide for the payment of bonds but also to spread the burden of retirement equitably over the life of the bonds. The simplest way to accomplish this would be to divide the total amount of bonds outstanding by the number of years over which the bonds are to run, the amount thus secured representing the annual contribution. However, cognizance must be taken of the fact that the amounts in the fund are invested and that the earnings are added to the fund. Total contributions to the fund are, therefore, smaller than total bonds to be retired by the amount of the earnings retained in the fund. In determining the periodic contribution to the fund, the rate of return on fund investments must be estimated, and since the earnings on each installment continue to be added to the fund and to earn money in turn, the computations must take into account compound interest.

Determining Amount to Be Contributed Periodically

The procedure in determining the amount to be contributed periodically may be summarized as follows:

1. Determine the amount of bonds to be retired.
2. Determine the number of periods during which the contributions will be made.
3. Determine the annual rate of earnings.
4. Use a special table to arrive at the amount of the contribution.

Table 5 can be used in the calculation of periodic contributions where no more than 40 periods are involved and the rate of earnings is not less than 1½ per cent nor more than 4 per cent. To illustrate how computations are made with the aid of this table, assume that bonds amounting to $100,000 are to be retired at the end of 20 years, that a deposit is to be made each year, and that the rate of earnings is 4 per cent. Referring to Table 5, trace down the column entitled "Periods" until the line covering 20 periods is reached. Moving horizontally across the table, we reach the earnings column, which, in this case, is the "4%" column. The figure corresponding horizontally with

the "20 periods" line and vertically with the "4%" column is \$0.0335818. In other words, approximately 3⅓ cents must be contributed each year for 20 years in order to accumulate \$1.00 at the end of 20 years. To get the amount of contributions necessary for the accumulation of \$100,000, it is only necessary to multiply the fraction by \$100,000, the product being \$3,358.18 (\$100,000 × .0335818), which is the amount to be contributed annually.

TABLE 6

ACCUMULATION OF SINKING FUND

Year	Annual Contribution	Fund Income	Accumulated in Fund
1........	\$3,358.18	......	\$ 3,358.18
2........	3,358.18	\$ 134.33	6,850.69
3........	3,358.18	274.03	10,482.90
4........	3,358.18	419.32	14,260.40
5........	3,358.18	570.42	18,189.00
6........	3,358.18	727.56	22,274.74
7........	3,358.18	890.99	26,523.91
8........	3,358.18	1,060.96	30,943.05
9........	3,358.18	1,237.72	35,538.95
10........	3,358.18	1,421.56	40,318.69
11........	3,358.18	1,612.75	45,289.62
12........	3,358.18	1,811.58	50,459.38
13........	3,358.18	2,018.38	55,835.94
14........	3,358.18	2,233.44	61,427.56
15........	3,358.18	2,457.10	67,242.84
16........	3,358.18	2,689.71	73,290.73
17........	3,358.18	2,931.63	79,580.54
18........	3,358.18	3,183.22	86,121.94
19........	3,358.18	3,444.88	92,925.00
20........	3,358.36*	3,716.64	100,000.00
TOTAL	\$67,163.78	\$32,836.22	\$100,000.00

* An adjustment of \$0.18 is necessary to bring the fund to \$100,000.

Table 6 has been constructed on the assumptions made in computing the amount to be contributed. It shows the amount to be contributed to the fund each year, the required annual income of the fund, and the total amount required in the fund at the end of each year, if sufficient money is to be available to retire term bonds when they mature.

The fund income figures are arrived at by multiplying the last balance for each year in the "Accumulated in Fund" column by 4 per cent. For example, the fund income for the sec-

ond year, amounting to $134.33, is arrived at by multiplying the first figure in the "Accumulated in Fund" column, namely $3,358.18, by 4 per cent.

Determining the Amount Which Should Be in the Fund at the End of Any Year

Each sinking fund should be examined at least once a year prior to making the contribution, in order to note whether the amount of assets in the fund corresponds to the amount which should be there. If contributions are made regularly, as calculated at the time the fund was established, and if the earnings are as contemplated, the amount in the fund will exactly equal requirements.

In this connection Table 6 would be useful, except for the fact that it must be built up. If, therefore, the amount which should be in the fund at the end of a particular year is the sole information wanted, rather than details as to contributions and earnings for each year, Table 7 can be used.

This table indicates the amount which will be accumulated in a sinking fund if $1.00 is contributed periodically for a varying number of periods and invested immediately to earn a specific rate of interest. To illustrate the use of this table, assume that the amount to be contributed annually, as well as the rate of earnings, is similar to that used in the previous illustration. Further, assume that it is desired to know the amount which should be in the fund at the end of fifteen years.

The first step is to trace down the "Periods" column until the 15th period is reached. Since the assumed rate of earnings is 4 per cent, it is necessary to refer to the last column, which is the column applicable to earnings of 4 per cent. The figure corresponding horizontally with the "15 periods" line and vertically with the "4%" column is $20.0235876. In other words, if $1.00 earning interest of 4 per cent were contributed annually to a fund for 15 years, the total accumulation of the fund would be around $20.02. In this case, however, it is assumed that $3,358.18 will be contributed annually. Accordingly, in order to get the amount which should be in the fund, it is necessary to multiply $3,358.18 by 20.0235876. The product, $67,242.84, is the amount which should be in the fund. This is also the amount which Table 6 indicates should be in the fund at the end of the fifteenth year.

TABLE 7 [2]

Amount which a sinking fund will equal if $1.00 is contributed periodically for a varying number of periods and invested immediately to earn a specific rate of interest.

Periods	1½%	1¾%	2%	3%	3½%	4%
1	$1.0000000	$1.0000000	$1.0000000	$1.0000000	$1.0000000	$1.0000000
2	2.0150000	2.0175000	2.0200000	2.0300000	2.0350000	2.0400000
3	3.0452250	3.0528063	3.0604000	3.0909000	3.1062250	3.1216000
4	4.0909034	4.1062304	4.1216080	4.1836270	4.2149429	4.2464640
5	5.1522669	5.1780894	5.2040402	5.3091358	5.3624659	5.4163226
6	6.2295509	6.2687060	6.3081210	6.4684099	6.5501522	6.6329755
7	7.3229942	7.3784083	7.4342834	7.6624622	7.7794075	7.8982945
8	8.4328391	8.5075305	8.5829691	8.8923361	9.0516868	9.2142263
9	9.5593317	9.6564122	9.7546284	10.1591061	10.3684958	10.5827953
10	10.7027217	10.8253995	10.9497210	11.4638793	11.7313932	12.0061071
11	11.8632625	12.0148439	12.1687154	12.8077957	13.1419919	13.4863514
12	13.0412114	13.2251037	13.4120897	14.1920296	14.6019616	15.0258055
13	14.2368296	14.4565430	14.6803315	15.6177905	16.1130303	16.6268377
14	15.4503821	15.7095325	15.9739382	17.0863242	17.6769864	18.2919112
15	16.6821378	16.9844494	17.2934169	18.5989139	19.2956809	20.0235876
16	17.9323698	18.2816772	18.6392853	20.1568813	20.9710297	21.8245311
17	19.2013554	19.6016066	20.0120710	21.7615877	22.7050158	23.6975124
18	20.4893757	20.9446347	21.4123124	23.4144354	24.4996913	25.6454129
19	21.7967164	22.3111658	22.8405586	25.1168684	26.3571805	27.6712294
20	23.1236671	23.7016112	24.2973698	26.8703745	28.2796818	29.7780786
21	24.4705221	25.1163894	25.7833172	28.6764857	30.2694707	31.9692017
22	25.8375799	26.5559262	27.2989835	30.5367803	32.3289022	34.2479698
23	27.2251436	28.0206549	28.8449632	32.4528837	34.4604137	36.6178886
24	28.6335208	29.5110164	30.4218625	34.4264702	36.6665282	39.0826041
25	30.0630236	31.0274592	32.0302997	36.4592643	38.9498567	41.6459083
26	31.5139690	32.5704397	33.6709057	38.5530423	41.3131017	44.3117446
27	32.9866785	34.1404224	35.3443238	40.7096335	43.7590602	47.0842144
28	34.4814787	35.7378798	37.0512103	42.9309225	46.2906273	49.9675830
29	35.9987009	37.3632927	38.7922345	45.2188502	48.9107993	52.9662863
30	37.5386814	39.0171503	40.5680792	47.5754157	51.6226773	56.0849378
31	39.1017616	40.6999504	42.3794408	50.0026782	54.4294710	59.3283353
32	40.6882880	42.4121996	44.2270296	52.5027585	57.3345025	62.7014687
33	42.2986123	44.1544131	46.1115702	55.0778413	60.3412101	66.2095274
34	43.9330915	45.9271153	48.0338016	57.7301765	63.4531524	69.8579085
35	45.5920879	47.7308398	49.9944776	60.4620818	66.6740127	73.6522249
36	47.2759692	49.5661295	51.9943672	63.2759443	70.0076032	77.5983139
37	48.9851087	51.4335368	54.0342545	66.1742226	73.4578693	81.7022464
38	50.7198854	53.3336236	56.1149396	69.1594493	77.0288947	85.9703363
39	52.4806837	55.2669621	58.2372384	72.2342328	80.7249060	90.4091497
40	54.2678939	57.2341339	60.4019832	75.4012597	84.5502778	95.0255157

[2] Adapted from Laurence I. Hewes and James W. Glover, *Highway Bonds*, Bulletin No. 136, U. S. Dept. of Agriculture, Washington, 1917, pp. 62–63. The table is based on the assumption that interest is compounded as often as contributions are made. See footnote to Table 5.

Adjusting the Fund

If the amount contributed periodically, or the earnings, are greater or smaller than anticipated, the amount of assets in the fund will not equal the amount which should be in the fund. Usually, however, contributions are made according to a schedule, and differences between the amount in the fund and the amount which should be there arise primarily because of variations in earnings. Several factors account for variations in earnings. One is the inability to invest funds immediately after their acquisition. Another is the investment of funds in securities which yield a higher or lower return than that estimated. A third is the acquisition by the fund of the bonds for the retirement of which the fund is established, and their cancellation. The effect of canceling such bonds is to reduce earnings because if the bonds were held alive or other securities acquired, there would be a return thereon.

If the variation between the amount required to be in the fund and the amount actually in the fund is small, no adjustment is needed. If, however, the same conditions are expected to prevail in the future, thus making the differences cumulative, an adjustment should be made. Similarly, if the difference between the amount required and the amount in the fund is substantial, an adjustment in the amount to be contributed should be made.

The procedure in making such adjustment is to recompute the contributions on the basis of the remaining periods over which contributions to the fund are to be made, taking into account the amount already accumulated in the fund and the new rate of earnings. The detailed steps are as follows:

1. Determine how much the assets at present in the fund will earn between now and the date of maturity of the sinking fund bonds.
2. Deduct the sum thus arrived at from the total amount of bonds to be retired. The remainder constitutes the debt for which contributions need to be made.
3. Follow the same procedure as in determining contributions at the inception of the fund.

Table 8[3]

Amount which $1.00 plus its compounded earnings at a specific rate of interest will equal if allowed to accumulate for a varying number of years.

Years	1½%	1¾%	2%	3%	3½%	4%
1	$1.0150000	$1.0175000	$1.0200000	$1.0300000	$1.0350000	$1.0400000
2	1.0302250	1.0353063	1.0404000	1.0609000	1.0712250	1.0816000
3	1.0456784	1.0534241	1.0612080	1.0927270	1.1087179	1.1248640
4	1.0613636	1.0718590	1.0824322	1.1255088	1.1475230	1.1698586
5	1.0772840	1.0906166	1.1040808	1.1592741	1.1876863	1.2166529
6	1.0934433	1.1097024	1.1261624	1.1940523	1.2292553	1.2653190
7	1.1098449	1.1291222	1.1486857	1.2298739	1.2722793	1.3159318
8	1.1264926	1.1488818	1.1716594	1.2667701	1.3168090	1.3685691
9	1.1433900	1.1689872	1.1950926	1.3047732	1.3628974	1.4233118
10	1.1605408	1.1894445	1.2189944	1.3439164	1.4105988	1.4802443
11	1.1779489	1.2102598	1.2433743	1.3842339	1.4599697	1.5394541
12	1.1956182	1.2314393	1.2682418	1.4257609	1.5110687	1.6010322
13	1.2135524	1.2529895	1.2936066	1.4685337	1.5639561	1.6650735
14	1.2317557	1.2749168	1.3194788	1.5125897	1.6186945	1.7316765
15	1.2502321	1.2972279	1.3458683	1.5579674	1.6753488	1.8009435
16	1.2689856	1.3199294	1.3727857	1.6047064	1.7339860	1.8729813
17	1.2880203	1.3430281	1.4002414	1.6528476	1.7946756	1.9473005
18	1.3073406	1.3665311	1.4282463	1.7024331	1.8574892	2.0258165
19	1.3269508	1.3904454	1.4568112	1.7535061	1.9225013	2.1068492
20	1.3468550	1.4147782	1.4859474	1.8061112	1.9897889	2.1911231
21	1.3670578	1.4395368	1.5156663	1.8602946	2.0594315	2.2787681
22	1.3875637	1.4647287	1.5459797	1.9161034	2.1315116	2.3699188
23	1.4083772	1.4903615	1.5768993	1.9735865	2.2061145	2.4647155
24	1.4295028	1.5164428	1.6084373	2.0327941	2.2833285	2.5633042
25	1.4509454	1.5429805	1.6406060	2.0937779	2.3632450	2.6658363
26	1.4727095	1.5699827	1.6734181	2.1565913	2.4459586	2.7724698
27	1.4948002	1.5974574	1.7068865	2.2212890	2.5315671	2.8833686
28	1.5172222	1.6254129	1.7410242	2.2879277	2.6201720	2.9987033
29	1.5399805	1.6538576	1.7758447	2.3565655	2.7118780	3.1186515
30	1.5630802	1.6828001	1.8113616	2.4272625	2.8067937	3.2433975
31	1.5865264	1.7122491	1.8475888	2.5000804	2.9050315	3.3731334
32	1.6103243	1.7422135	1.8845406	2.5750828	3.0067076	3.5080588
33	1.6344792	1.7727022	1.9222314	2.6523352	3.1119424	3.6483811
34	1.6589964	1.8037245	1.9606760	2.7319053	3.2208603	3.7943163
35	1.6838813	1.8352897	1.9998896	2.8138625	3.3335905	3.9460890
36	1.7091395	1.8674073	2.0398873	2.8982783	3.4502661	4.1039326
37	1.7347766	1.9000869	2.0806851	2.9852267	3.5710254	4.2680899
38	1.7607983	1.9333384	2.1222988	3.0747835	3.6960113	4.4388135
39	1.7872103	1.9671718	2.1647448	3.1670270	3.8253717	4.6163660
40	1.8140184	2.0015973	2.2080397	3.2620378	3.9592597	4.8010206

[3] Adapted from Laurence I. Hewes and James W. Glover, *Highway Bonds,* Bulletin No. 136, U. S. Dept. of Agriculture, Washington, 1917, pp. 60–61. The table is based on the assumption that interest is compounded annually. To make the table applicable to cases where interest is compounded semi-annually, it is necessary merely to multiply the number of years by 2 and take one-half of the annual interest rate. For example, to find how much $1.00 will equal at the end of 10 years at 3 per cent interest compounded semi-annually, find the amount in the "1½%" column corresponding to 20 years.

Two examples will be used to illustrate the above procedure. Referring to Table 6, we note that the amount to be contributed annually, assuming the conditions indicated in the previous examples, is $3,358.18. Suppose, however, that at the end of the tenth year, bonds to the amount of $25,000 are called in and canceled. Assuming that the rate of income remains the same, the earnings of the fund will be reduced; accordingly, the amount to be contributed annually must be increased in order to compensate for the reduction in earnings.

Following out the procedure outlined above, the annual contribution to be made will be determined as follows:

1. The assets in the fund at the end of the tenth period should have been, as indicated in Table 6, $40,318.69. However, $25,000 in bonds were retired, leaving assets of $15,318.69 in the fund. These assets are to be held for 10 additional years and are assumed to continue to earn 4 per cent. By referring to Table 8, it will be found that if $1.00 is invested for 10 years at 4 per cent, the investment will amount to $1.4802443 at the end of the tenth year. Multiplying the amount in the fund by the latter figure, we arrive at $22,-675.40, which is the amount that would be in the fund at the end of the tenth year.
2. The total amount of bonds to be retired is $75,000. Deducting from this amount the last figure arrived at in 1 above, namely, $22,675.40, we get $52,324.60 as the amount which must be covered by annual contributions over the ten years.
3. The procedure from this point on is similar to that involved in determining the periodic contributions for a sinking fund at its inception. Thus, referring to Table 5, we note that to accumulate $1.00 at the end of ten periods, it is necessary to deposit $0.0832909 periodically. Therefore since it is desired to accumulate not $1.00 but $52,324.60, it is necessary to multiply this figure by $0.0832909. The product, $4,358.16, represents the amount of the new periodic contribution. (See Table 9.)

To illustrate another case necessitating an adjustment in the amount to be contributed, assume that, due to a reduction in the rate of income, there has been a reduction in the earnings of the fund. Table 9, for example, indicates that at the end of

the fifteenth year there was in the fund $42,060.95. Actually, if a sufficient sum is to be available to retire bonds when they mature, it is necessary that the fund should have accumulated $42,-242.72. Furthermore, it is assumed that the deficit is due to a decrease in the rate of earnings during the last year of from 4 per

TABLE 9

ACCUMULATION OF SINKING FUND

Year	Annual Contribution	Fund Income	Accumulated Fund	Retirements
1.........	$3,358.18	....	$ 3,358.18	....
2.........	3,358.18	$ 134.33	6,850.69	....
3.........	3,358.18	274.03	10,482.90	....
4.........	3,358.18	419.32	14,260.40	....
5.........	3,358.18	570.42	18,189.00	....
6.........	3,358.18	727.56	22,274.74	....
7.........	3,358.18	890.99	26,523.91	....
8.........	3,358.18	1,060.96	30,943.05	....
9.........	3,358.18	1,237.72	35,538.95	....
10.........	3,358.18	1,421.56	15,318.69	$25,000.00
11.........	4,358.16	612.75	20,289.60	....
12.........	4,358.16	811.58	25,459.34	....
13.........	4,358.16	1,018.37	30,835.87	....
14.........	4,358.16	1,233.43	36,427.46	....
15.........	4,358.16	1,275.33	42,060.95	....
16.........	4,670.39	1,472.13	48,203.47	....
17.........	4,670.39	1,687.12	54,560.98	....
18.........	4,670.39	1,909.63	61,141.00	....
19.........	4,670.39	2,139.94	67,951.33	....
20.........	4,670.38*	2,378.29	75,000.00	....
TOTAL	$78,724.54	$21,275.46	$75,000.00	$25,000.00

* An adjustment of $0.01 is necessary to bring the fund accumulations to $75,000.00.

cent to 3½ per cent and that this rate will probably continue for some time. The procedure in making the adjustment is similar to that illustrated above, as follows:

1. The $42,060.95 now in the fund and invested at 3½ per cent will amount to $49,955.21 at the end of the twentieth year ($42,060.95 × 1.1876863).
2. The amount of debt for which contributions are to be made is $25,044.79 ($75,000 — $49,955.21).
3. The annual contribution to be made is $4,670.39 ($25,-044.79 × 0.1864814).

Table 9 shows the annual contributions, fund income, and accumulations in the fund after giving effect to the various assumptions made above.

The illustrations above have dealt with instances where the rate of return was lower than that anticipated. Frequently, of course, the rate may be higher than that taken into consideration in calculating the annual contribution. Usually, however, it is better not to reduce the contributions because of the possibility that the rate of income may be reduced. If, on the other hand, conditions are such as to warrant a reduction, the methods illustrated above can be utilized.

Sinking Fund Administration

As indicated before, a sinking fund may be administered either by the water utility or by a trustee, there being no fundamental difference in the administration of the fund regardless of the party administering the same. Accordingly, the following discussion of the administration of sinking funds is applicable to all cases.

The assets of the sinking fund normally consist of cash and investments. Only sufficient cash should be kept to enable the management to meet obligations as they become due. The need for investing sinking fund cash immediately upon its collection is apparent since greater earnings can be secured by investing the money than depositing it in the bank. Depositories in which funds are held pending payment of maturing bonds should be chosen with great care. In the case of municipal utilities it is quite common, and frequently a legal requirement, for the bank to furnish security either in the form of a surety bond or in the form of collateral securities. The amount of security should equal the maximum amount of deposits which it is estimated will be held by the bank at any one time. Such securities should be held in escrow by a disinterested third party.

One of the major functions in sinking fund administration is the proper investment of sinking fund cash. An attempt should be made, of course, to invest in securities which will bring the greatest return, but safety of principal should receive primary consideration. Another important point to remember is that only those securities should be selected which mature prior to the maturity date of the bonds for which the sinking fund was

created. In other words, safety and liquidity should be the two governing factors.

Municipal utilities are usually limited by statute or city charter as to the types of securities in which their funds may be invested. They may usually, however, invest in federal, state, and municipal securities.

Both municipal and private water utilities will find it advisable to invest in the bonds for the retirement of which the fund was created. Such bonds offer the safest investment although it is possible that the rate of return may not be as high as it would be if investment were made in other securities. An interesting question arises as to whether the bonds so acquired should be canceled. Generally speaking, the answer is no; they should be held alive, the reason being that otherwise the annual contributions have to be recomputed every time such bonds are acquired. Cancellation is also objectionable from the standpoint of the bondholders because cancellation reduces the earnings of the fund since the canceled bonds no longer bear interest. Nothing, therefore, seems to be gained by cancellation except elimination of the possible resale of the bonds, which, if the sinking fund is properly administered, there should be no reason for fearing.

It is, however, advisable in two instances to cancel reacquired sinking fund bonds: (1) if all the bonds of a particular issue have been acquired, or (2) if there is a surplus in the fund. In the latter case, however, only an amount equal to the accumulated surplus should be canceled. Some statutes or charters, on the other hand, provide that all reacquired sinking fund bonds must be canceled.

Although thus far the assumption has been that only one sinking fund was involved, the utility may have several bond issues outstanding and may set up several sinking funds. This is particularly true of municipal water utilities. Furthermore, for purposes of investment it may be desirable to pool cash belonging to the various sinking funds, in which case the earnings on investments must be prorated among the various sinking funds on the basis of the amount contributed by each.

Indication was previously made that bonds in which sinking fund cash is invested should bear an earlier maturity date than the bonds to be retired. If bonds outstanding have an earlier

maturity date than the bonds held by the sinking fund, the utility may be forced to sell investments at a loss. In general, securities should be held in the fund until maturity. Where, however, there is not only a possibility of making a substantial profit on the sale of the investments but also a possibility of acquiring other investments of comparable safety at a price which will not wipe out the profit made on the sale of the first securities, it may be advisable to sell such investments. It should be clearly understood, however, that the sinking fund is not a trading account.

Securities should be so kept that there will be no possibility of theft or mishandling. Only responsible officials should have access to them, and whenever possible, sinking fund securities should be registered. If they cannot be registered, they should be endorsed so as to prevent their negotiability without proper authorization.

Where securities are purchased at a premium or at a discount, it is necessary to amortize such premium or discount at each interest date. Since the method of amortization is similar to that involved in amortizing premiums and discounts on bonds issued, the reader is referred to Chapter 18.

Sinking fund money should be used only for the purchase of investments and retirement of bonds. All expenses connected with the administration of the sinking fund, such as premiums on surety bonds, salaries of officials administering the funds, and other similar expenses, should be considered a general non-operating revenue deduction and not deducted directly from the revenues of the sinking fund.

Sinking Fund Records

The essential records to be used in connection with sinking fund administration are similar to those utilized in the administration of the general investments of the utility. Consequently, the reader is referred to Figures 102 and 103 for illustrations of the special records involved.

Entries

Entries will not vary materially regardless of whether the fund is administered by the utility or by a trustee. The following entries are based on the assumption that the fund is administered by a trustee, indication being made in each instance,

however, wherein the procedure would differ if the fund were administered by the utility.

To insure that the surplus or net earnings of the utility will not be distributed either as a contribution to the municipality in the case of a municipal utility or as dividends in the case of a private utility, it is desirable to set aside a part of the net income or surplus each year as a reserve for the retirement of sinking fund bonds. The amount to be set aside is the total of the contribution for the period plus the earnings of the amount accumulated in the fund to date. Reference would usually be had to a schedule similar to that illustrated in Table 9. For example, referring to that table, we note that the amount to be set aside at the end of the first year is \$3,358.18; at the end of the second year, \$3,492.51 (\$3,358.18 + \$134.33); at the end of the third year, \$3,632.21 (\$3,358.18 + \$274.03); etc. Since these sums continue to be added to the reserve for each year, the balance of the reserve indicates the amount of assets which should be in the fund.

When the segregation of surplus is made, the entry is:

Miscellaneous Reservations of Surplus (413)	\$3,358.18	
Reserve for Retirement of Sinking Fund Bonds (259)......................		\$3,358.18
An entry in the General Journal to record the segregation of surplus for a reserve for retirement of sinking fund bonds.		

If net income is to be segregated, the entry is:

Miscellaneous Reservations of Net Income (540)	\$3,358.18	
Reserve for Retirement of Sinking Fund Bonds (259)......................		\$3,358.18
An entry in the General Journal to record the segregation of net income for the purpose of establishing a reserve for retirement of sinking fund bonds.		

It should be noted that the net effect is the same in either case, namely, the segregation of earnings. However, the segregation of net income rather than surplus is desirable from the creditor's standpoint in that it prevents the setting aside of income for some other purpose and allows only the remaining balance to be transferred to surplus.

The next step is authorizing the payment of the money into the fund. Assuming the fund is to be administered by a trustee, the entry would be:

Sinking Fund (113)....................	$3,358.18	
Vouchers Payable (222)..............		$3,358.18
An entry in the Voucher Register to authorize payment of contribution to sinking fund trustee.		
Vouchers Payable (222).................	$3,358.18	
Cash (120)..........................		$3,358.18
An entry in the Check Register to record payment of voucher.		

On the other hand, assuming that the utility administers its own sinking fund but a separate bank account is provided for the fund, the entries would be somewhat similar to those above except that details would be given as to the nature of the assets of the fund. Thus, a separate subsidiary account would be provided to show sinking fund cash, a separate account to show sinking fund investments, etc. Specifically, the entries would be as follows:

Sinking Fund (113)....................	$3,358.18	
Vouchers Payable (222)..............		$3,358.18
An entry in the Voucher Register to authorize payment of contribution into a sinking fund. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Cash (113.1), $3,358.18.[4]		
Vouchers Payable (222).................	$3,358.18	
Cash (120)..........................		$3,358.18
An entry in the Check Register to record payment of voucher.		

If, however, sinking fund cash is merely carried as a separate account on the books, a separate bank account not being provided, the following entry would be made:

[4] Theoretically some such subsidiary account as Due from Utility General Fund should be debited. It is assumed, however, that very little time elapses between the issuance of the voucher and the check, so that for practical purposes Sinking Fund Cash may be debited directly and the accounting procedure thereby simplified.

Sinking Fund (113).....................	$3,358.18	
Cash (120).........................		$3,358.18

An entry in the General Journal to record transfer of general cash to a sinking fund. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Cash (113.1), $3,358.18.

As indicated before, money received as a sinking fund contribution should be invested immediately. Assuming that the utility handles its own sinking fund and that securities on which there is accrued interest are purchased at a premium, the entry to record such transaction would be:

Sinking Fund (113).........................	$3,070	
Vouchers Payable (222)....................		$3,070

An entry in the Voucher Register to record authorization of investment of sinking fund cash. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Investments—Par Value (113.2), $3,000; Accrued Interest on Sinking Fund Investments Purchased (113.3), $40; Unamortized Premiums on Sinking Fund Investments (113.4), $30.

Vouchers Payable (222).....................	$3,070	
Sinking Fund (113)......................		$3,070

An entry in the Check Register to record payment out of sinking fund. SUBSIDIARY ACCOUNTS: *Credit* Sinking Fund Cash (113.1), $3,070.

It should be noted that the net effect of the two entries as far as the general ledger accounts are concerned is a debit to the Sinking Fund account (113) for $3,070 and a corresponding credit to the same account (113) for $3,070. The entries portray the actual situation: The assets of the sinking fund do not change. There is merely a substitution of investments for cash—a change which is effected through the subsidiary accounts, which show details as to sinking fund cash, investments, etc.

When interest is accrued on the records, the following entry should be made:

Sinking Fund (113)..............................	$60	
Revenues from Sinking Fund (525.1)............		$60

An entry in the General Journal to record interest accrued on sinking fund investments. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Interest Receivable (113.5), $60.

Since, however, part of the revenues represent accrued interest purchased, and since part of the unamortized premiums must be reduced each period, an entry should be made reducing the Revenues from Sinking Fund account (525.1) by the amount of such interest and premiums. The entry is as follows:

Revenues from Sinking Fund (525.1)	$42	
Sinking Fund (113)		$42

An entry in the General Journal to record reduction of interest accrued by amount of accrued interest purchased and amortization of premiums. SUBSIDIARY ACCOUNTS: *Credit* Accrued Interest on Sinking Fund Investments Purchased (113.3), $40; Unamortized Premiums on Sinking Fund Investments (113.4), $2.

When the cash representing the accrued interest on the investment is received, the entry is:

Sinking Fund (113)	$60	
Sinking Fund (113)		$60

An entry in the Cash Receipts Register to record receipt of accrued interest on sinking fund investments. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Cash (113.1), $60. *Credit* Sinking Fund Interest Receivable (113.5), $60.

It should be noted that since there is merely an exchange of sinking fund assets, sinking fund cash replacing accrued interest receivable, the control account is not affected by this entry.

If the sinking fund is in the hands of a trustee, the entry is made upon receipt of a report from the trustee indicating the amount earned. Such report will usually give all the necessary details regarding sinking fund income. The entry to be made is similar to that for income on investments when the utility administers the sinking fund itself, except that no subsidiary accounts are involved. The entry is:

Sinking Fund (113)	$78	
Revenues from Sinking Fund (525.1)		$78

An entry in the General Journal to record earnings of sinking fund per report of trustee dated February 15, 19—.

The entries to record the sale of sinking fund investments are similar to those involved in recording the sale of general investments. Although indication has been made that invest-

ments should not be sold except under certain circumstances, assume that they are sold and that a profit is realized. In such an instance the entry will be:

Sinking Fund (113)	$10,400	
Sinking Fund (113)		$10,200
Revenues from Sinking Fund (525.1)		200

An entry in the Cash Receipts Register to record the sale of investments at a profit. SUBSIDIARY ACCOUNTS: *Debit* Sinking Fund Cash (113.1), $10,400. *Credit* Sinking Fund Investments—Par Value (113.2), $10,000; Unamortized Premiums on Sinking Fund Investments (113.4), $200.

It is advisable to meet the expenditures connected with the administration of the sinking fund out of the utility's general revenues. The entry to record such expenses would be:

Miscellaneous Income Deductions (538)	$100	
Vouchers Payable (222)		$100

An entry in the Voucher Register to record authorization to pay expenses connected with the administration of sinking funds.

Vouchers Payable (222)	$100	
Cash (120)		$100

An entry in the Check Register to record payment of voucher.

The last step in accounting for the administration of a sinking fund is the retirement of the bonds. The entries will, at this point, vary according to whether the city administers its own sinking fund or whether the latter is administered by a sinking fund trustee. Assuming that the utility administers its own fund, the entries will be as follows:

Bonds (210)	$50,000	
Vouchers Payable (222)		$50,000

An entry in the Voucher Register to record authorization to retire bonds.

Vouchers Payable (222)	$50,000	
Sinking Fund (113)		$50,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Sinking Fund Cash (113.1), $50,000.

On the other hand, if the fund is administered by a trustee, the entry will be:

Bonds (210)	$50,000	
Sinking Fund (113)		$50,000
An entry in the General Journal to record retirement of bonds.		

In either case an entry must be made returning to surplus the amounts reserved for the retirement of bonds. The entry is:

Reserve for Retirement of Sinking Fund Bonds (259)	$50,000	
Miscellaneous Credits to Surplus (401)		$50,000
An entry in the General Journal to record return of reserve to surplus.		

Summary

In summary, it should be noted that one of the principal characteristics of a sinking fund is that the fund has earnings which are retained and which, in turn, earn money. It is particularly important to keep this characteristic in mind since in many instances interest and serial bonds are paid out of sinking funds. This practice is not recommended, however. Serial bonds should be paid either out of general funds or a special redemption fund. Similarly, interest should be paid either out of general funds or a special interest fund. A sinking fund should be used solely for the retirement of term bonds.

Construction Funds

Entries

Construction funds are special funds set aside for the purpose of financing construction. Such funds may be established from the proceeds of the sale of bonds, from advances by customers, or from an appropriation of earnings. The entries involved in each case are as follows:

Construction Fund (117)	$102,000	
Unamortized Premium on Debt (240)...		$ 2,000
Bonds (210)		100,000
An entry in the cash Receipts Register to record receipt of proceeds from sale of bonds at a premium. SUBSIDIARY ACCOUNTS: *Debit* Construction Fund Cash (117.1), $102,000.		

Construction Fund (117)..................	$11,000	
Customers' Advances for Construction (241)		$11,000

An entry in the Cash Receipts Register to record the receipt from customers of funds to be used in financing construction. SUBSIDIARY ACCOUNTS: *Debit* Construction Fund Cash (117.1), $11,000.

Three entries are necessary to record the establishment of a fund through segregation of earnings. These are as follows:

Miscellaneous Reservations of Surplus (413)..	$25,000	
Reserve for Construction Fund (261)......		$25,000

An entry in the General Journal to record segregation of surplus for financing construction.

Construction Fund (117)..................	$25,000	
Vouchers Payable (222)..................		$25,000

An entry in the Voucher Register to record authorization of transfer of general funds to construction fund. SUBSIDIARY ACCOUNTS: *Debit* Construction Fund Cash (117.1), $25,000.[5]

Vouchers Payable (222)....................	$25,000	
Cash (120)..............................		$25,000

An entry in the Check Register to record payment of voucher.

As expenditures for construction are incurred, the liability therefor is recorded in the same manner as for operating expenses. For example, the liability for engineering survey costs is recorded as follows:

Construction Work in Progress (100.3).........	$2,000	
Vouchers Payable (222)....................		$2,000

An entry in the Voucher Register to record authorization to pay for engineering services.

[5] Theoretically some such subsidiary account as Due from Utility General Fund should be debited. It is assumed, however, that very little time elapses between the issuance of the voucher and the check, so that for practical purposes Construction Fund Cash may be debited directly and the accounting procedure thereby simplified. An example of what is involved in the more complicated procedure will be found in the entries illustrated on pages 324 and 325 dealing with the disbursements of Construction Fund Cash.

Vouchers Payable (222)......................	$2,000	
Construction Fund (117)..................		$2,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $2,000.

When construction work is performed under contract and payments therefor are made monthly on the basis of cost of construction for the month less the retention of a certain percentage of such costs until the contract is completed and approved, the entry is:

Construction Work in Progress (100.3).........	$7,000	
Vouchers Payable (222)....................		$7,000

An entry in the Voucher Register to record authorization of payment on contract.

Vouchers Payable (222)......................	$7,000	
Construction Fund (117)..................		$7,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $7,000.[6]

Certain expenditures may be made out of the general funds of the utility which are chargeable to construction projects. Assuming that part of the expenses connected with the generation of power are chargeable to a construction job to be financed out of a construction fund, the entries would be as follows:

Construction Work in Progress (100.3).........	$1,000	
Operating Expenses (502).................		$1,000

An entry in the General Journal to charge Construction Work in Progress account with cost of power applicable to construction. SUBSIDIARY ACCOUNTS: *Charge* work order affected. *Credit* Power Transferred (730), $1,000.

Due from Construction Fund (133.1)..........	$1,000	
Construction Fund (117).................		$1,000

An entry in the General Journal to record liability of construction fund to *utility's* general fund. SUBSIDIARY ACCOUNTS: *Credit* Due to Utility (117.2), $1,000.

[6] See footnote on page 323, but note that here disbursements are involved.

Construction Fund (117)	$1,000	
Vouchers Payable (222)		$1,000

An entry in the Voucher Register to record authorization to reimburse utility. SUBSIDIARY ACCOUNTS: *Debit* Due to Utility (117.2), $1,000.

Vouchers Payable (222)	$1,000	
Construction Fund (117)		$1,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $1,000.

Cash (120)	$1,000	
Due from Construction Fund (133.1)		$1,000

An entry in the Cash Receipts Register to record receipt of cash from construction fund.

If there are insufficient assets in the construction fund to meet total construction costs, the remaining funds may have to be raised either by additional contributions from customers, by the sale of additional bonds, or by segregation of additional general funds of the utility. The entries will in each case be similar to those illustrated in connection with the establishment of the fund.

On the other hand, the manner in which a surplus in the fund is disposed will depend on the source from which the revenues were derived. If such funds were secured from the sale of bonds, the money might be used for bond retirement. If the fund was built up from contributions by customers, the remaining balance will probably be returned to such customers. If a construction fund is established by a transfer from the utility's general funds, the balance is disposed of by transfer to such funds. The entries will in each case be respectively as follows:

Bonds (210)	$10,000	
Vouchers Payable (222)		$10,000

An entry in the Voucher Register to record authorization to retire bonds from construction funds.

Vouchers Payable (222)	$10,000	
Construction Fund (117)		$10,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $10,000.

	Debit	Credit
Customers' Advances for Construction (241)....	$1,000	
Vouchers Payable (222)...................		$1,000

An entry in the Voucher Register to record authorization to return part of contribution in aid of construction.

	Debit	Credit
Vouchers Payable (222)......................	$1,000	
Construction Fund (117)..................		$1,000

An entry in the Check Register to record payment of voucher. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $1,000.

	Debit	Credit
Cash (120)................................	$1,000	
Construction Fund (117)..................		$1,000

An entry in the Cash Receipts Register to record return of cash in construction fund to general cash. SUBSIDIARY ACCOUNTS: *Credit* Construction Fund Cash (117.1), $1,000.

	Debit	Credit
Reserve for Construction Fund (261)........	$25,000	
Miscellaneous Credits to Surplus (401)		$25,000

An entry in the General Journal to record return of reserve to earned surplus.

Chapter 16

INVESTMENTS

Introduction

Investments may be classified as temporary or long-term. Temporary investments are those expected to be converted into cash within a period of less than one year; long-term investments are those intended to be held for a longer period. Temporary investments usually consist of marketable securities; long-term investments may consist, in addition, of securities of associated companies or others, of physical property not used or intended to be used in utility operations, and of advances to associated companies.

The following discussion is concerned with accounting for the various types of securities or other assets in which a utility may make an investment. It should be noted, however, that reference here is to general investments of the utility. Sinking fund investments are discussed in detail in Chapter 15.

Investment Records

Detailed records should be kept of investments, the records varying with the nature of the investment. For bond investments two records are necessary. One is a Register of Bond Investments, showing full details regarding securities acquired, such as description, purchase price, maturity date, nominal and effective interest rates, amount of interest due each period, and similar information. A form for such a register is illustrated in Figure 102.

To control bond investments effectively, it is also necessary that the information be classified so that payment of interest on each investment can be watched currently. For this purpose individual records of bond investments (Figure 103) serve. A separate card should be prepared for each block of like bonds which mature on the same date. These cards are used for following up interest due and for recording receipt of interest. They also provide the data for setting up accrued interest receivable

FIGURE 102

REGISTER OF BOND INVESTMENTS

Purchase Date	Description	Bond Numbers	Amount Paid				Maturity Date	Nominal Interest Rate	Effective Interest Rate	Interest Dates	Amount of Interest Due Each Period	Date of Sale or Redemption
			Par Value	Premium or Discount	Accrued Interest	Total Amount Paid						

and for determining the unamortized premiums or discounts which must be considered in computing profit or loss on investments sold. In addition, the cards are useful as a follow-up for maturing investments.

The information to be entered on the front of the card is self-explanatory. The back of the card provides space for recording the earnings on each item of investment. All columns except the "Date" column can be filled in at the time this card record is first prepared. The entry in the "Date" column should be made only when interest is actually received.

Records of investments in physical property are similar to those for fixed assets used in the utility's operations. For details, the reader is therefore referred to Chapter 17, dealing with the accounting procedure for fixed assets. No special records are necessary for investments in stocks and advances to affiliates, the general records of the utility sufficing for this purpose.

Bonds

Bonds comprise about the only type of security in which money is invested for both short and long periods. Since there is some difference in the manner in which short- and long-term investments are treated, each type of investment will be discussed separately. It should be remembered, however, that in either case, if registered bonds are purchased, the utility should —since the interest will be sent to the registered owner— promptly register itself as the owner of the bonds. Moreover, if the bonds are coupon bonds, careful examination of the bond certificates should be made to see that all future interest coupons are attached. These coupons should be clipped from the bond on the appropriate interest date and sent to the issuing corporation. Banks ordinarily accept coupons for collection in return for a small fee for such service.

Short-Term Investments

The entry to record acquisition of short-term investments is as follows:

Temporary Cash Investments (123)	$10,000	
Vouchers Payable (222)		$10,000

An entry in the Voucher Register to record authorization to invest funds temporarily.

FIGURE 103 (Front)

RECORD OF INVESTMENTS

Maturity Date________ Interest Dates________

Description________

Date Purchased________ Price: Par________ Premium or Discount________ Accrued Interest Purchased________

Interest Rate________ Amount Each Period________ Where Payable________

If Registered—How?________ Accrued Interest to End of Year________

Date Sold or Redeemed________ Sale Price: Par________ Premium or Discount________ Accrued Interest Received________

Remarks:________

FIGURE 103 (Back)

INTEREST ON INVESTMENTS

Date Received	Nominal Income	Premium or Discount * Amortized	Net Income	Unamortized Premium or Discount *

Vouchers Payable (222)	$10,000	
Cash (120)		$10,000
An entry in the Check Register to record payment of voucher.		

No cognizance was taken above of interest that may have accrued on the bonds at the time of purchase, the assumption being that the investments were acquired immediately after interest had been paid for the last interest period. Assuming, however, that the securities were acquired between interest dates and that the interest accrued up to time of purchase was $100, the entry would be:

Temporary Cash Investments (123)	$10,100	
Vouchers Payable (222)		$10,100
An entry in the Voucher Register to record authorization to invest funds temporarily. Par value of bonds, $10,000; accrued interest on bonds purchased, $100.		
Vouchers Payable (222)	$10,100	
Cash (120)		$10,100
An entry in the Check Register to record payment of voucher.		

Supposing that at the end of the next interest period, interest of $200 is received, the entry would be as follows:

Cash (120)	$200	
Temporary Cash Investments (123)		$100
Interest Revenues (524)		100
An entry in the Cash Receipts Register to record receipt of $200 in interest.		

It should be noted that although the total amount of interest received is $200, only a half of this sum is reported as interest revenues, the remaining $100 representing interest accrued at date of purchase. Such interest does not represent revenue since it was included in the amount paid for the bonds. Therefore, the investment account must be reduced by the amount of interest purchased.

Another point worth noting is that no attempt is usually made to amortize premiums or discounts on short-term investments. Thus, for example, assuming that $10,000 par value bonds were bought at a premium of $200, the entry would be:

Temporary Cash Investments (123)	$10,200	
Vouchers Payable (222)		$10,200

An entry in the Voucher Register to record authorization to invest cash temporarily in bonds. Par value $10,000; premium $200.

Vouchers Payable (222)	$10,200	
Cash (120)		$10,200

An entry in the Check Register to record payment of voucher.

The entry to record the sale of temporary investments—assuming that the value of the bonds, as carried on the records, is $10,300, that interest to the amount of $100 has accrued, and that the selling price is $10,600—would be as follows:

Cash (120)	$10,600	
Temporary Cash Investments (123)		$10,300
Interest Revenues (524)		100
Miscellaneous Non-Operating Revenues (526)		200

An entry in the Cash Receipts Register to record sale of investments at a profit.

Assuming the same conditions as above, except that the bonds were sold at a loss of $200, the entry would be as follows:

Cash (120)	$10,200	
Non-Operating Revenue Deductions (527) ...	200	
Temporary Cash Investments (123)		$10,300
Interest Revenues (524)		100

An entry in the Cash Receipts Register to record sale of investments at a loss.

Long-Term Investment in Bonds

The entries for long-term investments vary from those for short-term investments in that in the case of the former, premiums and discounts need to be amortized over the life of the bonds. Amortization methods and the reasons for amortizing premiums or discounts are given in Chapter 18, dealing with invested equities. Although the discussion there is from the standpoint of the debtor, the principles are the same.

Two alternative procedures may be followed in recording premiums, discounts, and accrued interest purchased. One is

to include them all in the Investments account, in which event details are shown only on the Register of Bond Investments. Another is to set up separate subsidiary accounts for each of these items.

The following entries illustrate respectively (1) the method whereby no subsidiary accounts are provided, and (2) the method whereby such accounts are provided, the assumptions being that bonds to the amount of $50,000 were acquired at a premium of $500 and that interest accrued on the bonds at date of purchase amounted to $800:

Investments (112)	$51,300	
Vouchers Payable (222)		$51,300

An entry in the Voucher Register to record authorization to purchase bonds of a par value of $50,000 at a premium of $500 and accrued interest of $800.

Investments (112)	$51,300	
Vouchers Payable (222)		$51,300

An entry in the Voucher Register to record authorization to purchase bonds at a premium and accrued interest. SUBSIDIARY ACCOUNTS: *Debit* Investments—Par Value (112.1), $50,000; Unamortized Premiums on Investments (112.2), $500; Accrued Interest on Investments Purchased (112.4), $800.

In either of the above two cases, when the cash is paid, the entry is:

Vouchers Payable (222)	$51,300	
Cash (120)		$51,300

An entry in the Check Register to record payment of voucher.

In order to make the discussion clear, it will be assumed throughout succeeding entries that subsidiary accounts are provided.

When interest is received at the next interest payment date, an entry must be made reducing interest income by the amount of the premium and accrued interest purchased. Assuming that the amount received is $1,000 and the amount of premium to be amortized is $50, the following entry would be made:

Cash (120)	$1,000	
Investments (112)		$850
Interest Revenues (524)		150

An entry in the Cash Receipts Register to record receipt of interest, amortization of premiums, and the reduction of Investments account by amount of accrued interest purchased. SUBSIDIARY ACCOUNTS: *Credit* Unamortized Premiums on Investments (112.2), $50; Accrued Interest on Investments Purchased (112.4), $800.

Assuming the same conditions as in the foregoing entries, except that the investments are purchased at a discount of $500, the entry to record the purchase would be as follows:

Investments (112)	$50,300	
Vouchers Payable (222)		$50,300

An entry in the Voucher Register to record authorization to purchase securities at a discount. SUBSIDIARY ACCOUNTS: *Debit* Investments—Par Value (112.1), $50,000; Accrued Interest on Investments Purchased (112.4), $800. *Credit* Unamortized Discounts on Investments (112.3), $500.

Vouchers Payable (222)	$50,300	
Cash (120)		$50,300

An entry in the Check Register to record payment of voucher.

When interest is received at the next interest payment date, an entry must be made increasing interest revenues by the amount of the discount amortized and decreasing such revenues by the amount of accrued interest purchased. The entry, assuming the amount of discount to be amortized at date of entry is $50, would be as follows:

Cash (120)	$1,000	
Investments (112)		$750
Interest Revenues (524)		250

An entry in the Cash Receipts Register to record receipt of interest and reduction of Investments account by amount of discount amortized. SUBSIDIARY ACCOUNTS: *Debit* Unamortized Discounts on Investments (112.3), $50; *Credit* Accrued Interest on Investments Purchased (112.4), $800.

Whether premiums or discounts are amortized or not, it may be desirable to include the market value of the bonds in parenthesis on the balance sheet.

The following entries illustrate the procedure in recording the sale of bonds purchased at a premium or discount, such premium or discount not having been fully amortized at date of sale. It is assumed that some interest had accrued on the bonds at date of sale and that in the first case the bonds were sold at a profit and in the second at a loss.

Cash (120)	$10,700	
Investments (112)		$10,200
Interest Revenues (524)		200
Miscellaneous Non-Operating Revenues (526)		300

An entry in the Cash Receipts Register to record sale of investments and accrued interest thereon at a profit. Subsidiary accounts: *Credit* Investments—Par Value (112.1), $10,000; Unamortized Premiums on Investments (112.2), $200.

Cash (120)	$9,700	
Miscellaneous Income Deductions (538)	300	
Investments (112)		$9,800
Interest Revenues (524)		200

An entry in the Cash Receipts Register to record sale of investments and accrued interest thereon at a loss. Subsidiary accounts: *Debit* Unamortized Discounts on Investments (112.3), $200. *Credit* Investments—Par Value (112.1), $10,000.

Real Estate

As indicated before, real estate, if possessed of an attractive earning power or likely to appreciate greatly in value, may be held as an investment if funds are not likely to be needed for a long time. Purchases of real estate for investment are to be distinguished from real estate acquired for use in the operation of the utility, the former being treated in the same manner as other types of investment. Accordingly, the entries to record such investments would be:

Investments (112)	$15,000	
Vouchers Payable (222)		$15,000

An entry in the Voucher Register to record authorization to make investment in real estate.

Vouchers Payable (222)	$15,000	
Cash (120)		$15,000

An entry in the Check Register to record payment of voucher.

Subsidiary accounts should be provided for recording the details regarding such investments. The records will be similar to those for fixed assets (discussed in detail in Chapter 17) used in carrying on the activities of the utility.

Investments in real estate vary in some respects from those in securities, the outstanding point of variation being in the matter of managing the investment. In the case of securities, no problem of management is involved except to see that the full amount of income therefrom is collected. In the case of real estate, on the other hand, proper management of the investment is an important factor. Such management consists in seeing that the property is properly maintained, that the maximum amount of income is secured therefrom, and that the expenditures are not excessive. Moreover, proper cognizance must be taken of depreciation, which should be considered a part of the expenses, because otherwise the income from such property will be overstated.

All revenues and expenses applicable to such investments, including depreciation, must be accounted for separately. The following entries illustrate the manner in which such revenues and expenses are recorded:

Cash (120)	$1,000	
Revenues from Lease of Other Physical Property (522)		$1,000

An entry in the Cash Receipts Register to record receipt of revenues from real estate investment.

Non-Operating Revenue Deductions (527)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record authorization of expenses in connection with operation of property held as an investment.

Non-Operating Revenue Deductions (527)	$100	
Reserve for Depreciation and Amortization of Other Property (253)		$100

An entry in the General Journal to record depreciation on property held as an investment.

If it is desired to show in detail the expenses involved in operating the investment, proper subsidiary accounts indicating each type of expense should be provided.

Advances to Affiliates

Advances to affiliates represent the value of loans, services rendered, or expenses incurred for the benefit of associated enterprises, which are not settled currently. These advances may be evidenced by time or demand notes, or by open accounts, the ultimate payment of such receivables usually being contingent and not conditioned upon a stated maturity. Such advances may be either interest bearing or not, but any income therefrom should be treated as non-operating revenue. If interest on advances is paid currently, the amount accrued at the time a balance sheet is prepared should be shown on the balance sheet as a current asset. If, however, interest is not paid currently, the amount accruing at any statement date should be added to the amount advanced and shown with the other investment accounts on the balance sheet.

The entries to record advances to affiliates are as follows:

Investments in Associated Companies (111) ..	$10,000	
Vouchers Payable (222)		$10,000

An entry in the Voucher Register to record authorization to make an advance to an affiliated company.

Vouchers Payable (222)	$10,000	
Cash (120)		$10,000

An entry in the Check Register to record payment of voucher.

If interest is paid currently, the entry to record accrued interest receivable is as follows:

Interest and Dividends Receivable (128)	$100	
Interest Revenues (524)		$100

An entry in the General Journal to record interest accrued on advances to affiliates which is to be paid currently.

If, on the other hand, interest is not to be paid currently, the entry is:

Investments in Associated Companies (111)	$100	
Interest Revenues (524)		$100

An entry in the General Journal to record interest accrued on advances to affiliates which is not to be paid currently.

Loans to Operating Municipality

Loans and advances made by the utility to the operating municipality when subject to repayment but not subject to current settlement should be treated similarly to advances made to associated companies by a private utility. The entries, assuming the same amounts as above are involved, would therefore be as follows:

Loans to Operating Municipality (111)	$10,000	
Vouchers Payable (222)		$10,000

An entry in the Voucher Register to record authorization to make advance to operating municipality.

Vouchers Payable (222)	$10,000	
Cash (120)		$10,000

An entry in the Check Register to record payment of voucher.

In this case, too, if interest is paid currently, the entry to record accrued interest receivable is as follows:

Interest and Dividends Receivable (128)	$100	
Interest Revenues (524)		$100

An entry in the General Journal to record interest, to be paid currently, accrued on loans to operating municipality.

If interest is not to be paid currently, the entry would be:

Loans to Operating Municipality (111)	$100	
Interest Revenues (524)		$100

An entry in the General Journal to record interest, not to be paid currently, accrued on loans to operating municipality.

Chapter 17

PLANT ACCOUNTING

Introduction

As used here, the term "plant" refers to all the fixed assets of the utility; and as is evident from the classification of utility plant accounts in Chapter 3, such accounts may be classified as to whether or not they are used in the utility's operation. This chapter is devoted primarily to a discussion of utility plant in service (account 100.1), which may be subdivided into intangible plant and tangible plant. Each type of plant will be discussed separately.

Intangible Plant

Classes of Intangible Plant

The most common intangible fixed assets are organization expenses, the cost of franchises and consents, and the cost of patent rights, licenses, and privileges necessary or valuable to the conduct of the utility's operations. Only a few of these are discussed below, but the principles brought out can be utilized in accounting for the others.

Organization Expense

Organization expense represents the cost incidental to organizing an operating enterprise up to the time when revenues start to accrue. This cost includes the expense of securing federal and state authorization to engage in the utility business, the fees and expenses of incorporation, and the preliminary costs of office organization. Costs of financing, such as discount on bonds and stock, and such costs as expense of supervision of construction, are not included. Organization expense is subject to amortization, the rate of amortization being set up in the light of the circumstances surrounding the particular utility. When fully amortized, organization expense should be removed from the records.

Franchises and Consents

Franchises and consents represent the expenditures incidental to securing from federal, state, or other governmental agencies, the right to use governmental property in the conduct of utility operations. These rights may be for a stipulated period, or they may be in perpetuity. The expenditures which are recognized as assets represent advance payments for the right to use governmental property. When, in addition to these advance payments, annual payments must be made to preserve the rights, the annual payments are operating expenses.

If the advance payments are for a stipulated period, they should be amortized over that period. The specific expense account to which these charges should be made will depend upon what the privilege covers, but ordinarily the account will be connected with transmission or distribution activity. If the rights obtained are perpetual, the asset is not subject to amortization from the standpoint of time. Nevertheless, the cost of the perpetual rights should probably be amortized in order to be certain of the preservation of invested capital. The rate should be low, however, and the item should be removed from the records when fully amortized. Records of each franchise and consent should be maintained.

Entries

The entries to record the setting up of organization expense and franchises and consents are respectively as follows:

Organization (301)	$9,000	
Vouchers Payable (222)		$9,000

An entry in the Voucher Register to record authorization of expenses connected with the organization of the utility.

Franchises and Consents (302)	$50,000	
Vouchers Payable (222)		$50,000

An entry in the Voucher Register to record authorization of payment for franchise.

The amortization of each of these assets is recorded as follows:

Amortization of Organization Expense (504.1) ..	$1,000	
Reserve for Amortization of Organization Expense (251.1)		$1,000

An entry in the General Journal to record amortization of organization expense.

Amortization of Franchises and Consents (504.2)	$3,000	
Reserve for Amortization of Franchises and Consents (251.2)		$3,000

An entry in the General Journal to record amortization of franchises and consents.

When the balance in the account has been fully amortized, the reserve is charged and the account written off. The entry to write off fully amortized organization expense would be as follows:

Reserve for Amortization of Organization Expense (251.1)	$9,000	
Organization (301)		$9,000

An entry in the General Journal to record writing off of organization expense.

Tangible Fixed Plant

Classification of Tangible Fixed Plant

Tangible fixed plant may be divided in general into three main groups: land and land rights, structures and improvements, and equipment. Each of these should be classified, in turn, according to the function and activity for which employed. Land, for example, can be subdivided into reservoir land, office land, purification land, etc. The chart of accounts on pages 29 and 30 indicates the classification to be followed. It may be necessary, however, to subdivide some of the accounts shown on that chart still further. For example, although the classification provides for only one account for equipment (Transportation Equipment) (330), a separate record might be kept for each piece of equipment, as indicated in Chapter 12.

The nature of each of the three main classes of tangible fixed plant is discussed below.

Land

Land, as the term is defined by the National Association of Railroad and Utilities Commissioners, includes not only the

land which is owned in fee by the utility but also the cost of all rights to the use of land. These rights include leaseholds, easements, water and water power rights, water diversion rights, submersion rights, rights of way, etc. Therefore, because of the complexity of the items included under land, it is desirable that unit records be maintained for each individual parcel of land and for each right acquired. Although the rights to the use of land are really intangible fixed assets, they are classified, for convenience, with land. Land rights should be a matter of public record.

The cost of land owned in fee includes all the costs of acquisition (other than Plant Acquisition Adjustments discussed later) and any expenditures necessary to prepare the site for utility use. The costs of acquisition include the amount contracted to be paid to the vendor, liabilities assumed, legal expenses in connection with the perfection of title, fees to brokers, etc. Expenditures necessary to prepare the site for utility use include demolition of buildings not to be replaced, relocating structures, clearing the land, grading, etc. Benefit assessments assumed at the time of purchase are also a part of the cost of the land depending on the extent to which the benefit is not depreciable. If, for example, the benefit assessment is for a bridge which must be replaced in time, or for resurfacing a road the surface of which will have to be replaced at a future date, only that part of the benefit assessment which represents permanent value is a part of the cost of land. The balance of the assessment should be recorded separately and depreciated over the estimated life of the improvement covered by the assessment.

The cost of the rights to the use of land which are to be recorded represent advance payments for these rights. If no expenditure is incurred in their acquisition, no entry is necessary. If, however, annual or other periodic payments must be made to preserve these rights, the periodic payments should be considered as operating expenses.

If a land right is granted for a stipulated term, the cost of the right should be amortized over the period during which the right may be exercised. Land rights which are in perpetuity need not be amortized from a theoretical point of view. From a practical standpoint, however, it may be desirable to amortize them, the reason being that since they are usually valuable only

in connection with the operation of the utility, they may become valueless in time. They do not, like land owned in fee, offer the possibility of use for other purposes.

The site value of land is not subject to depreciation as a result of use. When source of supply land is extensive and covers a watershed, and it is necessary to forest the land, expenditures of forestation are a part of the land cost. The expenses of caring for such a forest are, however, operating expenses. If forest products are sold without impairing the usefulness of the land for water supply purposes, the revenue should be credited to miscellaneous water revenues, the cost of securing this revenue being a non-operating revenue deduction.

Structures and Improvements

Under structures and improvements are included "all permanent structures for impounding, collecting and storing water and structures, buildings (including purification buildings) and shelters to house, support or safeguard property or persons, including all fixtures permanently attached to and made a part of buildings and which cannot be removed therefrom without cutting into the walls, ceilings or floors, or without in some way impairing the building."[1] Each group of structures and improvements should be classified in accordance with the chart of accounts illustrated on pages 29 and 30.

The cost of structures and improvements includes the expenses of labor and materials which can be directly allocated either to such structures and improvements or to overhead expenses. Overhead expenses consist of such items as shop expenses applicable to construction, insurance costs, rent for construction office, such proportion of the salaries of engineers, surveyors, and draftsmen as is applicable to construction work, legal expenditures, a proper proportion of the general and administrative expenses applicable to construction work, taxes on physical property during construction, and interest. The latter includes the cost of borrowed funds used in carrying on construction and a reasonable rate of interest on the utility's own funds, to the extent that these are used. It must be remembered, however,

[1] National Association of Railroad and Utilities Commissioners, Committee on Statistics and Accounts of Public Utility Companies. *Uniform System of Accounts for Water Utilities (Classes A & B)*, p. 65.

that only interest expenses incurred during the period of construction may be included as a cost of construction, interest costs becoming income deductions after the structure or improvement has been completed. When a part of the plant is completed and put into operation, the interest on funds borrowed or on the utility's own funds used to finance the construction of the particular part of the plant ceases, even though the plant as a whole has not been completed.

The reason for the inclusion of interest as a cost of construction is that in a regulated industry the investment devoted to the purpose of the utility is entitled to earn a given rate of return. If an additional investment is being made, non-recognition of the cost of borrowing or of the interest which might be earned on ownership equity if the assets behind this equity were removed and invested elsewhere, would be to penalize ownership during the period of construction, the reason being that owners would thereby be forced to bear greater expenses than the rates will recover, and also be compelled to forego income which they might have had by investing in another industry. As soon as construction is completed, the use of the improvement will presumably help in producing revenues, and the cost of the improvement will be a part of the rate base. Until the improvement is completed and put to use, construction expenditures are not costs of operation, since they do not benefit or further operation.

Equipment

By equipment is meant all tangible utility plant except land and structures and improvements. If the utility constructs part of its own equipment, all the items of cost enumerated in connection with the construction of structures and improvements should be added to the cost of direct labor and materials in order to arrive at the cost of such equipment. If equipment is purchased, the cost includes, in addition to the purchase price, sales taxes, transportation expenses, and cost of installation.

Tools which have a relatively small value (less than $10) and are likely to be lost or stolen, should be charged to a tool rather than an equipment account. The difference between tools and equipment is that the former are treated more or less like materials, a perpetual inventory record, supported by an

actual physical count, being kept of them. The amount of tools issued and not on hand in the departments using the same is charged to operation expenses. An alternative procedure, and the one in use where perpetual inventory records are not kept, is to take an inventory at the end of each fiscal period. The difference between the inventory on hand at the beginning of the fiscal period, plus purchases during the period, and the inventory at the end of the period, is charged to operating expenses. However, special tools acquired in connection with certain types of equipment should be charged to such equipment as part of its cost.

Property Records

It is advisable to provide a separate record for each unit of property. By a unit of property is meant an item of plant which can be readily identified and accounted for by itself. A single record may, however, be used for a group of small units.

The record for each piece of property might show, among other things, (1) location, (2) any information which will identify the unit of property, such for example, as name of asset, description, and manufacturer's identification number, (3) any data, such as account number, which will tie the record in with the proper control account, and (4) information as to the cost of the asset, estimated life, scrap value, and other factors, which will determine the amount of depreciation to be charged annually. Provision must further be made for recording costs which result in the betterment of the asset (as distinguished from repairs).

A form for a property record for structures and improvements is illustrated in Figure 104; a similar form can be used for other types of fixed assets. For a description of the records to be kept for automotive equipment, the reader is referred to Chapter 12. In the case of meters owned by the utility, it is desirable to have a card showing the history of each meter, including its cost, date purchased, addresses at which used, number of times repaired, and similar information. A form for a Meter History Card is illustrated in Figure 105. In addition, a card similar to that illustrated in Figure 104 should be prepared for each group of meters of a similar type.

The property record should be arranged in accordance with

FIGURE 104

PROPERTY RECORD

20 Account No. **Structures and Improvements**

19 ______

18 Name of Asset ______

17 From Whom Acquired ______

Date Acquired ______

16 Length of Life ______ Residual Value ______

15 Where Taxed ______

14 **Description**

13 ______

12 ______

11 ______

10 ______

9 ______

8

	Date	Cost	Balance	Class	Amount
7					
6					
5					
4					
3					
2					
1					

FIGURE 105

METER HISTORY CARD

Kind	Size	Meter Number	Date Purchased	Cost	Date Retired

Address				Town			Dist.	Route	Folio
Date Set	Reading	Date Removed	Reading	Idle	Time	Reg.		Cause	
Intest F % S	Intest Date	Repaired At	Repair Date	Adj.	Par.	Gen.	Dia.	Next Test Read.	Next Test Date
Address				Town			Dist.	Route	Folio
Date Set	Reading	Date Removed	Reading	Idle	Time	Reg.		Cause	
Intest F % S	Intest Date	Repaired At	Repair Date	Adj.	Par.	Gen.	Dia.	Next Test Read.	Next Test Date
Address				Town			Dist.	Route	Folio
Date Set	Reading	Date Removed	Reading	Idle	Time	Reg.		Cause	
Intest F % S	Intest Date	Repaired At	Repair Date	Adj.	Par.	Gen.	Dia.	Next Test Read.	Next Test Date
Address				Town			Dist.	Route	Folio
Date Set	Reading	Date Removed	Reading	Idle	Time	Reg.		Cause	
Intest F % S	Intest Date	Repaired At	Repair Date	Adj.	Par.	Gen.	Dia.	Next Test Read.	Next Test Date

the classification of plant accounts shown on pages 29 and 30. That is, all cards for land should be arranged in one group, all cards for buildings in another, etc. Within each group the cards should again be arranged in the order indicated in the chart of accounts. Thus, the cards for structures and improvements should be arranged in the following order: (1) Source of Supply Structures, (2) Power and Pumping Structures, (3) Purification Buildings, (4) Distribution Reservoirs and Standpipes, and (5) General Structures and Improvements.

There are different methods of compiling total cost, depreciation, and other data pertaining to various classes of assets. Larger utilities make use of punch cards and tabulating equipment. For smaller utilities a practicable method is the use of specially designed cards similar to the one illustrated in Figure 104. Each class of assets and the sub-groups within the class are designated by cutting away a portion of the card between the hole and margin of the card. When it is desired to segregate cards applying to a particular class of assets, the cards are all aligned and wires are run through the holes designating the proper classification. Thus—since the holes have been cut away from the cards to be included in the classification—when the wires are pulled to the left, the cards not needed are pulled aside, leaving only those of the particular class desired. The desired information can then be taken off the cards and the total secured by running a tape on an adding machine.

Acquisition of Fixed Assets

All fixed assets are usually acquired either through construction by the utility itself or through purchase. The procedure in the purchase of fixed assets is not very much unlike that involved in buying materials and supplies; the reader is therefore referred to Chapter 7 for a detailed description of the procedure involved. The cost of the asset, as recorded on the books, is determined from vendors' invoices, freight invoices, and, for work done by the utility's own men in installing the equipment, from work orders.

Indication was made in Chapter 13 of the manner in which the cost of assets constructed by the utility is compiled. Briefly, the procedure involves the issuance of a work order authorizing construction. Then, when construction is completed, all the

FIGURE 106

ASSET TRANSFER ORDER

Number________________ Date________________

Transferred from____________________Department

Received by____________________Department

Identification			Items	Value					Cost of Transfer	Clearing				
Mfg's No.	Dept. No. (If any)	Inventory or Property No.		Date of Purchase	Cost	Estimated Life	Rate of Depreciation	Accumulated Depreciation		Date	Voucher No.	Acct. No.	Debit	Credit

Requested by________________

Approved________________

Approved________________

Received by____________ Date________

Charge Accepted________________
Dept. Head

Noted on Property Record____________
Property Clerk

Remarks:________________

costs that have been charged to the work order, including overhead expenses, are added; the proper plant controlling account is charged with such total cost, and a property record is set up.

Transfer of Fixed Assets

Fixed assets should not be transferred from one location to another, or from one use to another, without a formal order signed by an authorized official. Unless transfers are formally authorized, it is not possible to control plant accounts adequately. Proper control requires, among other things, that the management know exactly where each piece of equipment is located. Similarly, unless the uses to which the plant and equipment are being put is known, it will not be possible to charge activities with a proper share of the cost of maintaining the plant and a proper portion of depreciation. A form for an order transferring fixed assets is illustrated in Figure 106.

Asset Retirements

No asset should be retired without a retirement order specifically authorizing such action. The retirement order should be charged with the cost of the asset to be retired and with the cost of removing such asset. On the other hand, amounts received as insurance or the salvage value of the property retired and the reserve for depreciation should be credited to the retirement order. Where an asset is in the process of being removed at the balance sheet date, the balances in the retirement orders should be totaled and the total charged to a Retirement Work in Progress account (144). A form for a retirement order is illustrated in Figure 107.

Retirement Units. An understanding of what is a unit of property is essential to the proper accounting for retirements, a distinction usually being made between units of property and minor items. The book cost of any unit of property retired should be credited to the appropriate property account and charged to the reserve for depreciation regardless of whether or not it is replaced. The replacement must be set up without any reference to the cost of the asset which it replaces.

The National Association of Railroad and Utilities Commissioners, in conjunction with the American Water Works Association, is now preparing a list of retirement units for water

FIGURE 107

ASSET RETIREMENT ORDER

Number________________ Date________________

Retired from________________Department

Identification					Charges			Credits				Clearing				
Mfg's No.	Dept. No. (If any)	Inventory or Property No.	Date of Purchase	Items	Cost of Asset	Cost to Retire	Total	Salvage Value	Reserve for Depreciation	Total	Difference	Date	Voucher No.	Acct. No.	Debit	Credit

Requested by________________ Remarks________________

Approved________________

Approved________________

Noted on Property Record________________

Property Clerk

utilities. The former has already prepared a list of retirement units for electric utilities. The following quotations from the publication listing these retirement units will, it is believed, help in the appreciation of the importance of setting up proper units of property.

> The purpose of a list of retirement units for use in utility accounting is to create greater uniformity in accounting for replacements of property. In the absence of a uniform list of retirement units, practices among utilities and among commissions have varied, with the result that replacements which have been considered maintenance by one commission or utility have been considered property additions and retirements by others. The use of a uniform list of retirement units will also create greater uniformity in depreciation accounting. It is recognized, of course, that rates of depreciation for like property may vary in different localities. Nevertheless, there should be uniformity with respect to those items that, on replacement, are charged to depreciation reserve and those that are charged to maintenance.
>
> The adoption of a list of retirement units should not be construed as requiring a classification of utility plant in the accounts corresponding to the list of retirement units. The retirement unit is used for the purpose of distinguishing between items replaced through the plant accounts and those replaced through maintenance and can be used in plant accounting regardless of the classification reflected by the plant accounts. For example, the plant account might show only the total cost of a structure although it may be composed of a number of retirement units.
>
> In general, the list of proposed retirement units may be said to represent units of maximum size. No attempt has been made to list all the items of property which must be treated as retirement units. This has been done purposely with the thought that a particular utility or commission could subdivide the units listed herein in cases where it was considered advisable, and that, due to divergent views concerning retirement units, the first list should consist of fairly large units upon which substantial agreement might be reached among all concerned. Furthermore, as more experience is gained under actual working conditions, additions to or revisions of the list can be made as they are found to be necessary. This may be expected with any list as utility plant is continuously changing and a list of retirement units used in accounting for the plant must be changed accordingly.
>
> The use of the list of retirement units in accounting for replacements of plant may affect the amount of maintenance expenses of a particular utility accordingly as the practice of the utility in accounting for replacements differs from that based on the list of retirement units. In cases where a contract is in effect which was entered into by the utility under maintenance accounting practices previously followed by it, and the use of the list of retirement units will cause a change in the ac-

counting for maintenance charges which is in conflict with such contract or which would injure any of the parties thereto, and it is impossible or impracticable to change the contract, the list of retirement units may be modified by the utility with the approval of the Commission upon full disclosure to the Commission of the necessity for and the extent of such modification.

It is difficult to formulate any hard and fast rule for the accounting for replacement of portions of large structures or equipment, as such classes of property are frequently comprised of a number of small items which may be replaced from time to time. The nature of the item or items replaced, and the causes of and the conditions under which replacements occur are so varied that decision as to the correct accounting procedure will depend, in many instances, on the facts and circumstances in a particular case. It follows that, in the application of the general instructions contained herein with respect to structures and equipment, judgment is necessarily an important factor.

With respect to structures and equipment, treat as retirement units any item of property which is readily separable from and separately useful from the larger assembly of which it forms a part and which has a life of several years. It is, of course, contemplated that consideration will be given to the cost of an item and that certain items otherwise meeting the above distinction but which cost only a few dollars would not be considered a retirement unit.

Treat, also, as retirement units portions of structures or equipment replaced in cases where the replacement operates to extend the life of the structure or equipment or where it is necessary to record the replacement in the plant accounts in order that the records may, as nearly as practicable, show the cost of the structure or equipment as it actually exists.

Wherever appropriate, the retirement of any unit of property in the structures or equipment accounts shall include all costs of associated items which pertain solely to that unit, such as the costs of foundations; supports, ladders, runways, enclosures, guards; driving mechanisms; indicating, recording and measuring devices with their mountings; starting, control, regulating, protective and safety devices; switchboards; special lighting conduits and wiring; pipes; ducts; spouts; chutes; hoppers, etc.[2]

Minor Items. In this group are included all parts or elements which go to make up a unit of property. If a minor item of property is retired and *not replaced,* the procedure should be the same as when a unit of property is retired—namely, the reserve for depreciation should be charged, and the unit of

[2] National Association of Railroad and Utilities Commissioners, Committee on Statistics and Accounts of Public Utility Companies. *List of Retirement Units for Electric Utilities.* New York: State Law Reporting Company, 1937, pp. 3–4.

property credited, with the cost of the retired minor item. Where, however, the book cost of a minor item of property will be accounted for by its inclusion in the book value of the unit of property when the latter is retired, the unit of property need not be reduced by the amount of the minor item.

If minor items of property are retired and *replaced,* the cost of replacement should be charged as an operating expense (repairs) to the activity in which the unit of property of which the minor items are a part is used. If, however, the replacement results in making the asset more efficient—or, in other words, if the replacement constitutes a betterment—the expenditure must be analyzed to determine the portions attributable to replacements and betterments, respectively. The former would be charged to operating expenses, and the latter would be added to the cost of the unit.

Utility Plant Acquisition Adjustments

The National Association of Railroad and Utilities Commissioners recommends that utilities acquiring properties from an operating utility or utilities record such property at the original cost to the first utility devoting it to the public service. If the purchase price is in excess of the value so recorded, the excess is required to be recorded separately in an account called Utility Plant Acquisition Adjustments (100.5). In view of the fact that this recommendation will affect many utilities, the accounting procedure connected therewith is here illustrated. However, by so doing it is not intended to render any expression of opinion as to whether or not the recommendation is a desirable one.

Entries

The entries illustrated below relate to the following: (1) Acquisition of Assets, (2) Transfer of Assets, (3) Retirements, and (4) Utility Plant Acquisition Adjustments.

1. *Acquisition of Assets.* As indicated before, fixed assets may be acquired by the utility through either purchase or construction. The entries to record the acquisition of a utility plant were given in Chapter 4. The following entry illustrates the accounting procedure to record the acquisition of a single

fixed asset, which is assumed in this case to be electric pumping equipment:

Utility Plant in Service (100.1)	$10,000	
Vouchers Payable (222)		$10,000

An entry in the Voucher Register to record authorization to pay for equipment purchased. SUBSIDIARY ACCOUNTS: *Debit* Electric Pumping Equipment (316), $10,000.

Utility Plant in Service (100.1)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record authorization to pay expense of transporting equipment. SUBSIDIARY ACCOUNTS: *Debit* Electric Pumping Equipment (316), $500.

Utility Plant in Service (100.1)	$300	
Operating Expenses (502)		$300

An entry in the General Journal to charge utility plant with a proper portion of the expenses of pumping labor used in installing pumping equipment. SUBSIDIARY ACCOUNTS: *Debit* Electric Pumping Equipment (316), $300. *Credit* Operation Supervision and Engineering (721), $50; Pumping Labor (722.2), $250.

If the utility constructs a fixed asset, the entry to be made at the time the asset is completed is as follows:

Utility Plant in Service (100.1)	$10,000	
Construction Work in Progress (100.3)		$10,000

An entry in the General Journal to set up on the records cost of garage constructed. SUBSIDIARY ACCOUNTS: *Debit* Garage Buildings (312.-622), $10,000.

2. *Transfer of Assets.* No entry is needed to record the transfer of an asset from one location to another. It is only necessary to indicate the new location on the property record. Where, however, there is a change in the use of the asset, that is, where equipment is transferred to a use which is chargeable to a different activity, an entry must be made to record such transfer. Assuming, for example, that it is decided to transfer some of the tools and work equipment for use in the storeroom, the entry would be:

Utility Plant in Service (100.1)	$500	
Utility Plant in Service (100.1)		$500

An entry in the General Journal to record transfer of tools and work equipment for use in the storeroom. SUBSIDIARY ACCOUNTS: *Debit* Stores Equipment (331), $500. *Credit* Tools and Work Equipment (334), $500.

3. *Retirements.* Retirements are made by means of a retirement work order, and as expenses are incurred in this connection, they are charged to the retirement work order, the entry being:

Retirement Work in Progress (144)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record cost of dismantling shop equipment.

The book value of the asset to be retired is also charged to the retirement work order, the entry being:

Retirement Work in Progress (144)	$10,000	
Utility Plant in Service (100.1)		$10,000

An entry in the General Journal to record retirement of shop equipment. SUBSIDIARY ACCOUNTS: *Credit* Shop Equipment (332), $10,000.

On the other hand, the proceeds from the sale of salvage are credited to the work order, the entry being:

Cash (120)	$600	
Retirement Work in Progress (144)		$600

An entry in the Cash Receipts Register to record the sale of salvage.

The last entry, which is made after the asset has been completely disposed of, is as follows:

Reserve for Depreciation of Utility Plant (250)	$9,700	
Retirement Work in Progress (144)		$9,700

An entry in the General Journal to record charging the reserve for depreciation with the cost of asset retired, as follows:

Shop Equipment—Cost................		$10,000
Deduct Salvage..................	$600	
Less—Cost of Dismantling.......	300	300
Amount to be Charged to Reserve		$9,700

Thus far the assumption has been that a complete unit of property is retired. In such cases there is no relationship between retirements and the cost of property replacing them. In the case of minor items, however, the accounting procedure will differ according to whether or not the minor items are replaced and whether the replaced items result in bettering the asset.

Assuming that a group of minor items is retired and is not to be replaced, the entry would be:

Reserve for Depreciation of Utility Plant (250)	$25	
Utility Plant in Service (100.1)		$25

An entry in the General Journal to record retirement of shelves in garage. SUBSIDIARY ACCOUNTS: *Credit* Garage Buildings (312.622), $25.

If the items retired will be included in the unit when the latter is written off, no entry would be needed at this time.

Assuming that a minor item is retired and replaced, the entry would be:

Operating Expenses (502)	$15	
Vouchers Payable (222)		$15

An entry in the Voucher Register to record replacement of minor item of property (part of pump). SUBSIDIARY ACCOUNTS: *Debit* Maintenance of Pumping Equipment (727.2), $15.

As indicated before, minor item replacements which result in the betterment of the asset must be distinguished from those which merely tend to maintain its efficiency. Assuming that the total cost of replacing a minor item is $50, of which $15 represents the amount needed to maintain the operating efficiency of the unit and $35 represents the cost of betterment, the entry would be:

Operating Expenses (502)	$15	
Utility Plant in Service (100.1)	35	
Vouchers Payable (222)		$50

An entry in the Voucher Register to record replacement of minor unit which resulted in betterment of asset (pump). SUBSIDIARY ACCOUNTS: *Debit* Maintenance of Pumping Equipment (727.2), $15; Electric Pumping Equipment (316), $35.

4. *Utility Plant Acquisition Adjustments.* The entry to set up the adjustments arising out of the acquisition of plant are, assuming the conditions indicated in the entry (see also page 355), as follows:

Utility Plant in Service (100.1)	$100,000	
Utility Plant Acquisition Adjustments (100.5)	20,000	
Reserve for Depreciation of Utility Plant (250)		$ 10,000
Vouchers Payable (222)		110,000

An entry in the Voucher Register to record authorization to purchase utility plant as follows:

Purchase Price		$110,000
Cost to Original Owner	$100,000	
Less—Reserve for Depreciation	10,000	
Net Cost		90,000
Utility Plant Acquisition Adjustment		$ 20,000

Utility Plant Acquisition Adjustments should be amortized over a reasonable period of time. The entry to record the amortization thereof is as follows:

Amortization of Utility Plant Acquisition Adjustments (505 or 537.1)	$500	
Reserve for Amortization of Utility Plant Acquisition Adjustments (252)		$500

An entry in the General Journal to record amortization of utility plant acquisition adjustments.

It should be noted that the Amortization of Utility Plant Acquisition Adjustments account may be considered either an operating revenue deduction (505) or an income deduction (537.1). Which of the two it should be considered will depend on the particular circumstances surrounding the acquisition and will, in the case of private utilities operating under the supervision of a commission, be determined by the latter. Regardless of whether the Utility Plant Acquisition Adjustments account is considered an operating revenue deduction or an income deduction, the following entry is made when the account has been fully amortized:

Reserve for Amortization of Utility Plant Acquisition Adjustments (252)...........	$20,000	
Utility Plant Acquisition Adjustments (100.5)		$20,000

An entry in the General Journal to record closing out of balance in Utility Plant Acquisition Adjustments account and related reserve.

CHAPTER 18

CREDITOR AND OWNERSHIP EQUITIES

Introduction

As will be indicated subsequently, the two principal sources of capital for the private water utility are bonds and capital stock; whereas for the municipal water utility the principal sources of capital are bonds and contributions from the municipality. Both types of utilities may finance at least part of their distribution system extensions from either customers' advances or contributions.

There is a difference between bonds on the one hand, and stock, municipality's contribution, and contributions from customers, on the other. Bonds represent a liability of the utility, usually secured by a first claim on the utility's assets. Even holders of municipal utility bonds usually have a claim against the utility's assets, although they may have the further pledge of the city's general credit. The other accounts represent ownership rather than a liability; it is true that some of them approach the status of liabilities, (for example, municipal equity)· but even these must be distinguished from bonds in that not only the time the liability becomes due is indefinite, but also no particular assets are pledged for the payment of such liabilities.

BONDS

Classification of Bonds

Bonds may be classified, among other ways, on the basis of (1) the nature of the security, (2) the procedure in paying interest and principal, and (3) the method of retirement.

1. *Nature of Security.* Bonds issued by a private utility are usually secured by a mortgage on the utility's properties. The same may be true with a municipal utility's bonds. Some municipal utility bonds are, however, secured by the general credit of the municipality in which operated. Frequently, too, such

bonds are secured both by a mortgage on the utility's property and by the guarantee of the municipality.

2. *Procedure in Paying Interest and Principal.* Bonds issued by either private or municipal utilities may be classified as either coupon or registered. There may, however, be a provision granting holders of coupon bonds the privilege of registering them. Coupon bonds are those to which coupons are attached, each coupon representing the amount of interest payable at each interest payment date during the life of the bonds. The interest on such bonds is paid to the person presenting the proper coupon. Usually the principal, also, is payable to the person who presents the bond. On the other hand, a registered bond is one which has been registered by the utility, and payment is made to the registered owner regardless of who holds the bond.

Bonds may be registered as to interest or principal or both. Where bonds are registered as to interest, no coupons are attached to the bond because they are not needed. It is possible, however, to have a coupon bond which is registered as to principal, in which case the principal is payable to the registered owner and the interest to the person presenting the interest coupon. Moreover, the same issue of bonds may consist in part of registered and in part of non-registered bonds, such happening in cases where the bondholder is given the choice of registering his holdings.

3. *Method of Retirement.* Two of the most common methods of paying off bonds are the retirement of all bonds at one time and their gradual retirement. Bonds retired under the first method are usually referred to as term bonds; those under the second, as serial bonds.

Term bonds may be classified into two groups—namely, sinking fund bonds and others. Although most sinking fund bonds mature at one time, the funds for their retirement are accumulated by setting aside a certain sum each year in a sinking fund. Since such funds are usually invested and thus earn money, total contributions are less than the amount of bonds to be retired, the difference between the amount needed for retirement and the amount contributed being made up out of the earnings of the fund. The method of arriving at the amount to be set aside is discussed in detail in Chapter 15.

Although sinking fund bonds generally all mature at one time, this is not always true, provision sometimes being made for the retirement of certain parts of an issue at various times. Such periods, however, are usually widely separated in time, and funds for the retirement of such bonds must be accumulated to equalize the burden among the years included within each period.

Not all term bonds are sinking fund bonds. For example, the utility may intend to refund bonds when they mature, by which is meant putting out another issue of bonds and either using the proceeds for the retirement of the maturing issue or exchanging the refunding bonds for those maturing. In such a case, no sinking fund would be set up even though all the bonds matured at one time.

Serial bonds are those retired gradually over their life. Although usually an equal amount of bonds is paid off each year, such is not necessarily always true. The important feature about serial bonds is that the retirement is gradual and the period of time elapsing between maturity dates seldom exceeds three years.

The maturities of serial bonds should be so planned that the burden will be equalized among the different years over which the bonds are to run. Where only one issue is outstanding, this can be accomplished simply by providing for the retirement of an equal amount each year. A still better procedure, however, is to take cognizance of the fact that there is a continual decrease in interest payments as bonds are retired and to arrange maturities so that the amount retired each year increases as interest charges decrease. If more than one issue is outstanding, it is necessary to take account of the maturities of such other issues and the annual interest payments on the latter.

The problem of deciding which type of bond to issue (serial or term) is an important one and must be decided in the light of the particular circumstances in each case. Municipal utilities are usually limited by law as to the type of bonds which they may issue, and the increasing trend in the municipal utility field is toward the use of serial bonds. On the other hand, since refunding by private utilities is quite common, private utilities resort to term bonds.

Marketing Bonds

The success with which bonds are sold will depend to some extent on the marketing procedure developed. There should not, however, be much variation in marketing procedure as between private and municipal utilities. The chief points of difference which may affect marketing are: (1) the requirement that municipal utility bonds be sold to the highest bidder, and (2) the necessity of securing a legal opinion that the municipal utility bonds have been issued in accordance with legal requirements. However, some approval as to legality is also involved in the issuance of private utility bonds.

Since municipal utility bonds must be sold to the highest bidder, it is essential to reach as wide a number of bidders as possible. This can be accomplished by advertising in the proper financial papers, mailing out prospectuses to the bond houses, and reaching prospective bidders in other ways. A definite time (day and hour) of opening bids should be specified, and the bids should be opened in public at the specified time and then and there, after proper calculations, awarded to the highest bidder. Any delay is unfair since market conditions change and bids are made on the basis of present market conditions. Municipal utility bonds should always be offered first at public sale even if the law permits otherwise.

The following points regarding the marketing of bonds are taken from *Marketing Municipal Bonds*, a publication of the Municipal Finance Officers Association. Although reference is made throughout to municipal bonds, the procedure advocated is equally applicable to the marketing of the bonds of private water utilities.

> 1. *Rates of Interest.* A definite coupon rate fixed before the sale frequently does not represent the lowest interest rate at which the bonds can be sold. There is danger also that too low a rate will be set with consequently no bids. The municipality will then have to re-advertise and hold another sale. If the rate named is too high, the bonds will bring less favorable prices. Investors do not like to pay large premiums. Bonds which can be sold close to their par value usually command the best price. Therefore, if the law of the state permits it, notice of sale should specify interest "not to exceed a certain rate," and the bidder should be given the opportunity to name the coupon rate in multiples of 1/10, 1/4, or 1/2 per cent. This will enable the purchaser to bid for bonds bearing the lowest rate acceptable to the market. Fur-

ther, split-rate bidding should be allowed, i.e., offers for different portions of an issue bearing different rates, though bidders should be restricted to two or three different coupon rates. There should be no bar, however, to a bidder putting in more than one bid.

Nothing is gained by the present laws in most states which forbid sales below par. A high coupon rate is just as bad. The law, however, should fix the maximum interest cost. *A Model Bond Law* prepared by the National Municipal League (1929) recommends the following statutory provision: "All bonds of a municipality shall be sold by the governing body at not less than 95 per cent of par and accrued interest."

2. *Preparation of Bonds.* All precautions must be taken against counterfeiting and forgery. The proper municipal finance officer should deal *directly* with the banknote company printing and preparing the city's bonds. Only a firm which specializes in such work should be used because of the complications which arise in printing both the bonds and coupons attached. Economy in printing and preparation may prove very expensive to the municipality in the end. Marketability is further improved if the bonds are prepared under the supervision of and certified as genuine by a responsible trust company as registrar. Such companies will have the bonds printed or engraved, supervise execution of the bonds, and guarantee the genuineness of the signatures and seal thereon. Only a specially engraved stock of paper is used, all paper is accounted for, and all employees are bonded. And bonds so prepared cost but slightly more than the price for which they could be secured elsewhere.

3. *Dating Bonds.* Bonds should be dated as near the day of sale as possible. If the issue is dated in the future, the dealer will be forced to speculate on the future market, and will discount his price enough to play safe. If the issue is dated back, the investor will have to pay too much accrued interest.

4. *Denominations.* Bonds should be issued in denominations of $1,000, except to take care of odd amounts. Small and odd denominations are not desirable additions to safe deposit boxes.

5. *Interest Dates.* Interest should be made payable semi-annually.

6. *Maturities.* If the bonds are serials, maturities should block up into five, ten, twenty-five or more bonds. Dealers like to have good blocks, and will pay for having them that way.

7. *Registration.* The owner should have the privilege of registering both the principal and interest, or the principal only, of his bonds provided the municipality has proper facilities for handling registration. The bond form should state whether or not any charges will be made for registration, and exactly what steps must be complied with in order to effect a transfer of the registered bond. Larger cities may also very well permit the interchange of coupon and registered bonds at the holder's option, charging a fee representing only the actual cost of conversion. Small cities should not attempt to handle registration. Registration as to both principal and interest requires that all interest

be paid by check. A registered bond remains a negotiable instrument, but its negotiable character is temporarily suspended, thus affording protection in case of theft. Some institutional investors, and large individual owners, prefer to have their bonds fully registered. Avoidance of the bother of coupon clipping and an added precaution against theft are both accomplished. Practically all of the larger cities now register their bonds when asked to do so.

8. *Place of Payment.* The proper place of payment of interest and principal is still a debatable question. Many cities prefer to act as their own paying agent, because it enables them to ascertain more easily who owns their bonds. In case of a forced refunding operation, or a call of optional bonds, this is valuable information. Where special assessment bonds, or other obligations, will be absorbed largely by a local market, undoubtedly interest and principal should be payable at the city treasurer's office. Where the bonds, however, have a wider market, there is much to be said from the investor's standpoint in making principal and interest payable in only the largest financial centers. Particularly do the most substantial classes of investors frown upon the expense and annoyance frequently incurred in the collection of principal and interest outside such centers. . . .

. . . Funds should always be on deposit at the paying agency several days before the payments are due. The time which the paying agent may need in order to collect checks or bank drafts forwarded should also be taken into consideration. Tardiness in such matters is not soon forgotten. If no funds are available when coupons are presented for payment, they will be returned through the usual collection channels. To have to notify the depositor subsequently that the coupons will be paid, and to have to put the process of collection again in motion, is both annoying to all concerned and damaging to the city's reputation. In the case of registered bonds, interest checks should reach the holders on the day they are due.

Records

As soon as bonds are sold, entries should be made in the proper records to show the receipt of the proceeds and to indicate the liability. In addition, the amount of interest to be paid annually or semi-annually, as well as the principal maturing each year, must be calculated and set up. The records to be used are a Bond and Interest Record (Figure 108) and a Registered Bond Record (Figure 109). Two general books are also needed, namely, the General Ledger (Figure 1) and the Cash Receipts Register (Figure 5).

1. *Bond and Interest Record (Figure 108).* As soon as bonds are sold, they should be entered in a Bond and Interest Record. This record shows detailed general information regard-

FIGURE 108

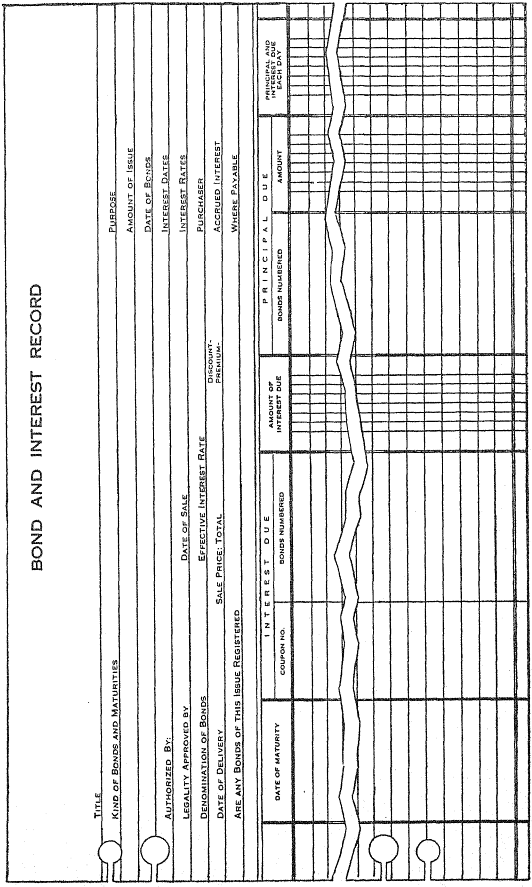
BOND AND INTEREST RECORD
TITLE
KIND OF BONDS AND MATURITIES
PURPOSE
AMOUNT OF ISSUE
DATE OF BONDS
AUTHORIZED BY:
INTEREST DATES
LEGALITY APPROVED BY
DATE OF SALE
INTEREST RATES
DENOMINATION OF BONDS
EFFECTIVE INTEREST RATE
PURCHASER
DATE OF DELIVERY
SALE PRICE: TOTAL
PREMIUM-
DISCOUNT-
ACCRUED INTEREST
ARE ANY BONDS OF THIS ISSUE REGISTERED
WHERE PAYABLE
DATE OF MATURITY
INTEREST DUE
COUPON NO.
BONDS NUMBERED
AMOUNT OF INTEREST DUE
PRINCIPAL DUE
BONDS NUMBERED
AMOUNT
PRINCIPAL AND INTEREST DUE EACH DAY

FIGURE 109

REGISTERED BOND RECORD

Purpose and Title of Issue..Date of Issue....................

Interest Rate..............................Payable on..............................Principal Payable at......................................

Item No.	Date Registered or Transferred	Bond No.	Name Registered in or Transferred to	Address	Amount	Maturity Date	Amount of Interest Each Period	Remarks

ing the bond issue, the amount of interest due each interest payment date, and the amount of principal due at each maturity date. In the case of term bonds, only one maturity date is involved. Where the bonds are registered, an indication must be made to that effect in the appropriate space on this record.

2. *Registered Bond Record* (*Figure 109*). Bonds registered either as to principal or interest require an additional book wherein to record detailed information as to the particular bonds registered, the name and address of the person in whose name the bonds are registered, the amount of the bond, maturity of principal, and, if registered both as to principal and interest, amount of interest due each period. The Registered Bond Record illustrated in Figure 109 is designed to show this information.

It must be remembered that, in addition, two separate accounts must be provided in the General Ledger for each bond issue, one showing principal outstanding and another showing accrued interest payable. Where numerous issues are involved, it may be advisable to set up a subsidiary Bonds Payable Ledger and Interest Payable Ledger, controlled by respective control accounts in the General Ledger.

Amortization of Premiums and Discounts on Bonds

Since the nominal interest rate, as stated on the bonds, seldom coincides with the market interest rate for the obligations at the time of issue, bonds are usually sold at either a premium or a discount. In order to get the effective rate of interest, the coupon rate must be adjusted. The sale of bonds at a premium results in the effective rate of interest being smaller than the nominal rate; whereas the sale of bonds at a discount results in the effective rate being greater than the nominal rate. The sale of bonds at a premium means that the utility will have to pay back a smaller sum than it receives; whereas the sale at a discount means that it will pay back a greater sum than it receives.

In order to get the effective rate of interest, it is necessary either to reduce interest expense for each period by deducting a proper proportion of premium or to increase interest expense by a proper proportion of the discount, depending respectively on whether the bonds have been sold at a premium or at a discount. The procedure whereby the balance of the unamortized

bond premium account is gradually reduced is known as amortization; that whereby the balance of the discount account is reduced, as accumulation. Since, however, the term amortization is frequently made to cover both, the term amortization, in order to simplify the discussion, will be used to cover both premiums and discounts.

Some of the more common methods of amortization are: (1) the straight-line method, (2) the compound interest method, and (3) the bonds outstanding method. Each is discussed in detail.

Straight-Line Method of Amortization. The straight-line method of amortizing premiums or discounts is the simplest. Under it, the total amount of discount or premium is divided by the total number of interest-paying periods in order to arrive either at the amount by which the balance of the discount account is to be reduced each period and the balance of the interest expense account correspondingly increased or at the amount by which the balance of the premium account is to be reduced and the balance of the interest expense account correspondingly increased. This method results in showing an equal annual interest charge. Actually, however, the interest cost decreases each year in the case of bonds issued at a premium and increases in the case of bonds issued at a discount. In the first instance, the utility is returning to the bondholder part of his premium each year, thereby reducing the amount of the bondholder's capital in the utility. In the second instance, on the other hand, the utility is postponing the payment of part of the interest until maturity, and as the maturity date approaches, the bondholder's capital in the utility increases.

Compound Interest Method. The compound interest method is more scientific than the straight-line method in that it takes account of the factors mentioned in the preceding paragraph. The effective interest rate is usually determined by the use of bond tables,[1] and, having determined it, the rate is

[1] Some of the published bond tables available are as follows: Johnson, David C., Stone, Caleb, Cross, Milton C., and Kircher, Edward A., *Yields of Bonds and Stocks.* New York: Prentice-Hall, Inc., 1938.

Sprague, Charles E., *Extended Bond Tables.* New York: The Ronald Press, 1915.

Bartholomew, James P., *Equitable Trust Company of New York Rapid Bond Tables.* Published by permission of Equitable Trust Company of New York, New

multiplied by the par value of bonds outstanding plus unamortized premium, or less unamortized discount, in order to give the amount of effective interest. The nominal interest is then deducted from the effective interest or vice versa in order to arrive at the amount of premium or discount to be amortized.

The following is an example of the method of arriving at the amount of bond premium or discount to be amortized under this method: Assume that an issue of $100,000 par value bonds, running over a period of 5 years and bearing a nominal interest rate of 4 per cent payable semi-annually, was sold on March 1, 1937 for $101,820. By referring to a bond table, it will be found that a bond sold on this basis yields 3.6 per cent per year. The effective interest for the first half year is, therefore, $1,832.76 $\frac{(\$101{,}820 \times 3.6\%)}{2}$. The amount of interest which will actually be paid is $2,000 $\frac{(\$100{,}000 \times 4\%)}{2}$. The difference between the amount of nominal interest (that is, interest actually paid) and the amount of effective interest, represents the amount by which the premium is to be amortized. Table 10 illustrates the amortization of premiums under the compound interest method, based on the assumptions made above.

The procedure in amortizing bond discounts is the same as for premiums. For example, assume that the bond issue used in the above illustration is sold for $98,220, or at a discount of $1,780. A bond table shows that bonds sold on this basis will yield 4.4 per cent. Therefore, the effective amount of interest for the first half year is $2,200 $\frac{(\$100{,}000 \times 4.4\%)}{2}$, while the nominal interest is $2,000, the difference representing the amount by which the balance of the discount account must be reduced. Table 11 illustrates the amortization of bond discount, based on the foregoing assumptions.

It was assumed above that the bonds all mature at one time. The compound interest method is, however, equally applicable to serial bonds, the only exception being where the bonds are

York.

Standard Tables of Bond Values. Financial Publishing Company, Boston.

TABLE 10

AMORTIZATION OF BOND PREMIUMS UNDER THE COMPOUND INTEREST METHOD

1	2	3	4	5	6	7
INTEREST PAYING PERIOD	INTEREST PAID	EFFECTIVE INTEREST	PREMIUM TO BE AMORTIZED	UNAMORTIZED PREMIUM	PAR VALUE OF BONDS	BOOK VALUE
	Figures in Column 6 multiplied by 2%	Figures in Column 7 multiplied by 1.8%	Column 2 minus Column 3	Column 5 minus Column 4		Column 5 plus Column 6
March 1, 1937.......				$1,820.00	$100,000.00	$101,820.00
Sept. 1, 1937.......	$ 2,000.00	$ 1,832.76	$ 167.24	1,652.76	100,000.00	101,652.76
March 1, 1938.......	2,000.00	1,829.75	170.25	1,482.51	100,000.00	101,482.51
Sept. 1, 1938.......	2,000.00	1,826.69	173.31	1,309.20	100,000.00	101,309.20
March 1, 1939.......	2,000.00	1,823.57	176.43	1,132.77	100,000.00	101,132.77
Sept. 1, 1939.......	2,000.00	1,820.39	179.61	953.16	100,000.00	100,953.16
March 1, 1940.......	2,000.00	1,817.16	182.84	770.32	100,000.00	100,770.32
Sept. 1, 1940.......	2,000.00	1,813.87	186.13	584.19	100,000.00	100,584.19
March 1, 1941.......	2,000.00	1,810.52	189.48	394.71	100,000.00	100,394.71
Sept. 1, 1941.......	2,000.00	1,807.10	192.90	201.81	100,000.00	100,201.81
March 1, 1942.......	2,000.00	1,798.19*	201.81*		100,000.00	100,000.00
Total	$20,000.00	$18,180.00	$1,820.00	—	$100,000.00	$100,000.00

* Adjustment of $5.44 necessary, due to use of table showing yields to 2 decimal places only.

TABLE 11

AMORTIZATION OF BOND DISCOUNTS UNDER THE COMPOUND INTEREST METHOD

1	2	3	4	5	6	7
Interest Paying Period	Interest Paid	Effective Interest	Discount to be Amortized	Unamortized Discount	Par Value of Bonds	Book Value
	Figures in Column 6 multiplied by 2%	Figures in Column 7 multiplied by 2.2%	Column 3 minus Column 2	Column 5 minus Column 4		Column 6 minus Column 5
March 1, 1937.......				$1,780.00	$100,000.00	$ 98,220.00
Sept. 1, 1937.......	$ 2,000.00	$ 2,160.84	$ 160.84	1,619.16	100,000.00	98,380.84
March 1, 1938.......	2,000.00	2,164.38	164.38	1,454.78	100,000.00	98,545.22
Sept. 1, 1938.......	2,000.00	2,167.99	167.99	1,286.79	100,000.00	98,713.21
March 1, 1939.......	2,000.00	2,171.69	171.69	1,115.10	100,000.00	98,884.90
Sept. 1, 1939.......	2,000.00	2,175.47	175.47	939.63	100,000.00	99,060.37
March 1, 1940.......	2,000.00	2,179.33	179.33	760.30	100,000.00	99,239.70
Sept. 1, 1940.......	2,000.00	2,183.27	183.27	577.03	100,000.00	99,422.97
March 1, 1941.......	2,000.00	2,187.31	187.31	389.72	100,000.00	99,610.28
Sept. 1, 1941.......	2,000.00	2,191.43	191.43	198.29	100,000.00	99,801.71
March 1, 1942.......	2,000.00	2,198.29*	198.29*		100,000.00	100,000.00
Total	$20,000.00	$21,780.00	$1,780.00	—	$100,000.00	$100,000.00

*Adjustment of $2.65 necessary, due to use of table showing yields to 2 decimal places only.

sold by blocks with a different market rate for each block, in which case it is necessary to treat each block of bonds as though it were a separate issue.

Bonds Outstanding Method. The bonds outstanding method is a modification of the straight-line method and is used in the amortization of premiums or discounts on serial bonds where the straight-line method is not applicable. Under this method, the amount of bonds that will be outstanding at the beginning of each year is determined, after which these amounts are totaled. Each amount is then divided by the total of all amounts in order to arrive at the percentage of premium or discount to be amortized each year. The percentages are then applied to the balance in the premium or discount accounts at the beginning of the year affected in order to arrive at the amount of premium or discount to be amortized.

To illustrate, assume that a $60,000 issue, bearing a nominal interest rate of 4 per cent payable semi-annually, and maturities of $10,000 each year, is sold for $62,000, that is, at a premium of $2,000. The amount to be amortized each year will be arrived at as indicated in Table 12.

Thus the percentage to be applied the first year is 28.6 per cent, arrived at by dividing $60,000 by $210,000. Since the total bond premium is $2,000, the amount to be amortized the first year is arrived at by taking 28.6 per cent of $2,000. The amount to be amortized the second year is arrived at by applying the percentage shown in the third column for that year, namely, 23.8 per cent to $2,000. The percentage and amount to be amortized during each of the succeeding years are thus similarly derived, and a similar procedure is followed in arriving at the amount of discount to be amortized.

The above table shows annual amortization; and to get the amount to be amortized semi-annually, it is only necessary to divide the amounts shown in the last column by two.

Summary

In general, the compound interest method is the most scientific, and the straight-line and bonds outstanding methods are the simplest for sinking fund and serial bonds, respectively.

Special problems arise in connection with amortizing the premiums and discounts on callable bonds, but it is beyond the

scope of this manual to treat these problems. The principles involved and the procedure to be followed will be found in books dealing with the principles of investment.

Entries

The entries in this section are designed to illustrate the following transactions: (1) the sale of the bonds at par, at a premium, at a discount, and between interest dates, (2) bond expenses, (3) interest on bonds, (4) amortization of premiums and discounts, (5) the retirement of bonds, (6) issuance and exchange of refunding bonds, and (7) reacquired bonds.

TABLE 12

AMORTIZATION OF PREMIUMS UNDER THE BONDS OUTSTANDING METHOD

Year	Amount Outstanding	Percentage of Premium to be Amortized	Amount of Premiums to be Amortized
1..........	$60,000	28.6%	$572.00
2..........	50,000	23.8	476.00
3..........	40,000	19.0	380.00
4..........	30,000	14.3	286.00
5..........	20,000	9.5	190.00
6..........	10,000	4.8	96.00
TOTAL	$210,000	100.0%	$2,000.00

1. *Sale of Bonds.* Assuming that bonds are sold at par, the entry to record such sale is:

Cash (120)	$100,000	
Bonds (210)		$100,000
An entry in the Cash Receipts Register to record sale of bonds at par.		

If the bonds are sold at a discount, the entry is:

Cash (120)	$96,000	
Unamortized Debt Discount and Expense (140)	4,000	
Bonds (210)		$100,000
An entry in the Cash Receipts Register to record the sale of bonds at a discount.		

If sold at a premium, the following entry is made:

Cash (120)	$104,000	
Bonds (210)		$100,000
Unamortized Premium on Debt (240)		4,000

An entry in the Cash Receipts Register to record sale of bonds at a premium.

It should be noted that if the premiums or discounts are applicable to different issues, bond premiums are recorded separately from bond discounts. If, however, parts of the same issue are currently sold at both a premium and a discount, a single account can be used, the title of the account being determined by whether the premiums more than offset the discounts, or vice versa.

If bonds are sold between interest dates, the selling price includes the amount of interest accrued to the date of sale since at the next interest date the full amount of interest for the period will be paid, whereas the purchaser is entitled only to the amount accruing between the date of purchase and the interest date. Accordingly, the entry to record sales made under such circumstances must recognize the amount of interest accrued to the date of sale. The entry is as follows:

Cash (120)	$101,000	
Bonds (210)		$100,000
Interest on Long-Term Debt (530)		1,000

An entry in the Cash Receipts Register to record sale of bonds at par between interest dates.

2. *Expenses in Connection with Issuing Bonds.* Expenses in connection with the issuance of bonds, such as the cost of printing bonds, commissions. etc., may be recorded in one account with bond discounts; it should, however, be possible to identify them. The entry to record the authorization of such expenditures is:

Unamortized Debt Discount and Expense (140)	$600	
Vouchers Payable (222)		$600

An entry in the Voucher Register to record authorization of expenditures in connection with issuance of bonds.

3. *Interest on Bonds.* Interest on bonds is usually paid semi-annually. The entry to record the accrued liability at the date as of which a financial statement is prepared, is as follows:

Interest on Long-Term Debt (530)	$2,000	
Interest Accrued (229)		$2,000

An entry in the General Journal to record accrued interest.

4. *Amortization of Premiums and Discounts.* The entry to record the amortization of a premium on bonds is as follows:

Unamortized Premium on Debt (240)	$50	
Amortization of Premium on Debt (532)		$50

An entry in the General Journal to record amortization of premium on bonds.

The entry to record the amortization of discount is as follows:

Amortization of Debt Discount and Expense (531) ...	$50	
Unamortized Debt Discount and Expense (140) ...		$50

An entry in the General Journal to record amortization of discount on debt.

5. *Retirement of Bonds.* The entries to record the retirement of sinking fund bonds are discussed in Chapter 15. Therefore, only the retirement of serial bonds will be considered here. Bonds may be paid either by the utility itself, through some agent, or through both. In the case of municipal utilities, payment through the city treasurer is considered as being made by the utility and not through an agent. The entries involved in those cases where bonds are paid by an agent are illustrated in Chapter 14. Where the bonds are paid directly through the utility's offices, the following entries would be made:

Bonds (210)	$2,000	
Vouchers Payable (222)		$2,000

An entry in the Voucher Register to record authorization to pay long-term debt.

Vouchers Payable (222)	$2,000	
Cash (120)		$2,000

An entry in the Check-Register to record payment of voucher.

6. *Refunding.* Refunding may be accomplished through the sale of refunding bonds and the use of the proceeds for the retirement of the matured bonds, or through offering holders of maturing bonds refunding bonds in exchange for the bonds held by them. The entries to record the sale of refunding bonds

are similar to those involved in recording the sale of bonds issued for the first time. Similarly, the entries to record the retirement of refunding bonds are similar to those illustrated for bonds issued for the first time.

Where bonds offered in exchange bear the same interest rate as the maturing bonds and are exchanged on the basis of par value, the entry to be made is as follows:

Bonds (210)	$100,000	
Bonds (210)		$100,000
An entry in the General Journal to record exchange of refunding bonds for maturing bonds.		

If, however, the refunding bonds are exchanged at a premium or a discount, the following entries would be made:

Bonds (210)	$100,000	
Bonds (210)		$98,000
Unamortized Premium on Debt (240)		2,000
An entry in the General Journal to record exchange of refunding bonds at a premium.		

Bonds (210)	$100,000	
Unamortized Debt Discount and Expense (140)	2,000	
Bonds (210)		$102,000
An entry in the General Journal to record exchange of bonds at a discount.		

7. *Reacquired Bonds.* If a utility reacquires some of its bonds and has no intention to cancel them, the bonds should be set up in a special account. The entry to record the acquisition of such bonds is as follows:

Reacquired Long-Term Debt (153)	$10,000	
Vouchers Payable (222)		$10,000
An entry in the Voucher Register to authorize payment in connection with the reacquisition of bonds.		

Vouchers Payable (222)	$10,000	
Cash (120)		$10,000
An entry in the Check Register to record payment of voucher.		

If the amount of the face value of the bond plus unamortized discount and expense, or less unamortized premium, is greater than the amount paid upon reacquisition, the difference should be credited to the Miscellaneous Credits to Surplus account (401) ; if, on the other hand, the difference is smaller, it should be entered in the Miscellaneous Debits to Surplus account (414).

Capital Stock

Classification of Capital Stock

Capital stock represents the equity of ownership of the utility, as evidenced by certificates showing the share that each stockholder has in the net assets of the utility. Stock may be classified as common and preferred, the difference between the two being that the preferred carries special privileges. These privileges may consist of preference as to dividends, that is, the requirement that holders of preferred stock must receive their dividend (which is usually a fixed percentage of the face value of each share) before common stockholders can receive any, preference as to assets in case of dissolution, or other privileges. In return for being granted such privileges, preferred stockholders ordinarily receive a smaller return than holders of common stock if operations are profitable, and frequently have no right to vote.

There are many kinds of preferred stock since the preferences which such shares of stock may carry are numerous. On the other hand, an increase in preferences granted to stock usually means a corresponding reduction in the earnings of such stock. In general, the practical difference between the two is that the preferred stock offers greater safety of principal but smaller earnings than common stock.

Since the accounting treatment is not materially different for preferred stock than for common stock, no distinction will be made between the two in outlining the accounting procedure. Attention will, however, be directed to differences which call for a variation in methods of accounting.

The issuance of stock is governed by state statutes, and in the case of water utilities there is frequently also the requirement of approval by, and issuance subject to, the supervision of a state

public service commission. These laws and regulations vary, and no attempt will, therefore, be made to mention them here.

The Records

The following records are usually needed to account properly for capital stock. The nature of each of these records can be gathered from the description given below.

1. *Subscription Register.* In this book are recorded the name and address of each subscriber, the number of shares subscribed for, and the amount. If the number of stockholders is small, however, a Subscription Register is not needed since the information can be conveniently recorded in the General Journal.

2. *Subscription Ledger.* In this ledger are kept the accounts for each subscriber, showing the amount subscribed for, the amount paid in, and the amount receivable. Postings to each account are made from the Subscription Register and the Cash Receipts Register. When full payment on the stock is received and the stock is issued, the accounts are closed. Where the number of subscriptions is small, however, a Subscription Ledger is not necessary since the individual subscribers' accounts can be included in the General Ledger.

3. *Capital Stock Certificate Book.* This book contains the stock certificates to be issued to the subscriber when full payment is received. They are attached to stubs on which full information as to ownership of the stock, the date issued, and the amount paid, are recorded. The data so recorded are derived from the Subscription Journal, Subscription Ledger, Cash Receipts Register, and Stock Transfer Register.

4. *Capital Stock Ledger.* A separate account is provided in this record for each stockholder, showing the number of shares issued to him as well as their total stated or par value. The accounts are closed when stock is retired or transferred to another owner.

5. *Stock Transfer Register.* In this book are recorded transfers of stock, the register only being needed if the utility itself makes records of transfers. If a transferring agent is employed, the utility will not need to keep this record.

Entries

Stock of a newly organized corporation is usually sold by subscription. A subscription is a contract, either written or implied, in which the subscriber undertakes to pay a certain sum of money for a number of shares. When capital stock is subscribed for, the entry is:

Subscriptions to Capital Stock (127)	$100,000	
Capital Stock Subscribed (204)		$100,000

An entry in the General Journal and in the Subscription Register to record subscriptions to capital stock. SUBSIDIARY ACCOUNTS: *Debit* each subscriber's account in the Subscription Ledger.

The assumption in the above entry was that the stock had been sold at par, or at stated value. Where stock is sold at a discount, the entry is:

Subscriptions to Capital Stock (127)	$98,000	
Discount on Capital Stock (150)	2,000	
Capital Stock Subscribed (204)		$100,000

An entry in the General Journal and in the Subscription Register to record subscription to capital stock. SUBSIDIARY ACCOUNTS: *Debit* each subscriber's account in the Subscription Ledger.

If sold at a premium, the entry is:

Subscriptions to Capital Stock (127)	$102,000	
Premiums and Assessments on Capital Stock (203)		$ 2,000
Capital Stock Subscribed (204)		100,000

An entry in the General Journal and in the Subscription Register to record subscription of stock at a premium. SUBSIDIARY ACCOUNTS: *Debit* each subscriber's account in the Subscription Ledger.

As subscriptions are paid, the entry is:

Cash (120)	$10,000	
Subscriptions to Capital Stock (127)		$10,000

An entry in the Cash Receipts Register to record receipt of cash on account of subscription to capital stock. SUBSIDIARY ACCOUNTS: *Credit*

each subscriber's account in the Subscription Ledger with the amount received.

Capital stock is usually not issued to subscribers until their subscription is paid. When full payment has been received and the stock is issued, the entry is:

Capital Stock Subscribed (127)	$100,000	
Capital Stock (Common or Preferred) (200 or 201)		$100,000

An entry in the General Journal to record issuance of stock. SUBSIDIARY ACCOUNTS: An account should be opened for each stockholder in the Capital Stock Ledger and credited with the par or stated value of the stock, or, in the case of no par or stated value, with the amount of cash received.

Expenses incurred in connection with the issuance of capital stock, such as cost of printing, commissions, etc., should be set up in a separate account as follows:

Capital Stock Expense (151)	$500	
Vouchers Payable (222)		$500

An entry in the Voucher Register to record authorization of payment of expenses in connection with the issuance of capital stock.

Such expenses may be either amortized or written off at one time, the entry being the same except that in case expenses are amortized, only a part of the expense will be written off each accounting period. The entry is as follows:

Miscellaneous Debits to Surplus (414)	$100	
Capital Stock Expense (151)		$100

An entry in the General Journal to record amortization (or complete closing out) of balance in Capital Stock Expense account.

MUNICIPAL EQUITY

Nature of Municipal Equity

Municipal equity should represent the amount which the operating municipality has advanced to its water utility plus any additions and less transfers from the utility to the municipality. The municipality may make advances to the utility with no ex-

press provision that such amounts are ever to be returned to the municipality, or provision may be made for transferring a part of the utility's funds each year until the amount advanced has been repaid. In either case, all details as to the original amount advanced, any additions, and the amount withdrawn, should be shown by the account. The account does not include temporary loans by the municipality to the utility. Such loans should be shown among the current liabilities of the utility. (See for example account no. 232, on page 26.)

Entries

The municipality may make the contribution from general unappropriated funds or from bond funds representing the proceeds of bonds sold specifically for this purpose. In either case the effect is the same as far as the utility is concerned because the bonds sold represent a general liability of the municipality and not of the utility. The entry to record the contribution received from the utility is as follows:

Cash (120)	$100,000	
Municipal Equity (266)		$100,000
An entry in the Cash Receipts Register to record receipt of contribution from municipality.		

When the amount contributed, or a part of it, is returned to the municipality, the following entry is made:

Municipal Equity (266)	$10,000	
Vouchers Payable (222)		$10,000
An entry in the Voucher Register to record authorization to repay contribution made by municipality.		
Vouchers Payable (222)	$10,000	
Cash (120)		$10,000
An entry in the Check Register to record payment of voucher.		

Contributions in Aid of Construction

Although amounts received as contributions from the opei ating municipality should be charged to the account Municipa Equity, contributions made by a municipality to a privat

water utility should be recorded in the account Contributions in Aid of Construction (265). Donations from customers, as well as contributions in aid of construction which have been made by customers or prospective customers of a municipal utility, should also be recorded in this account. Where, however, contributions by customers are made on condition that they are ultimately to be repaid wholly or in part, the contributions should not be recorded in the above account but rather in the Customers' Advances for Construction account (241).

The entry to record the receipt of contributions for construction is as follows:

Cash (120)	$25,000	
Contributions in Aid of Construction (265)		$25,000
An entry in the Cash Receipts Register to record receipt of contributions in aid of construction.		

PART V

FINANCIAL STATEMENTS AND FINANCIAL PLANNING

CHAPTER 19

THE PREPARATION OF FINANCIAL STATEMENTS

Introduction

The importance of financial statements can be judged from the fact that the purpose in setting up an accounting system is to provide for the recording of financial data from which such statements may be prepared. Whether the financial statements can be prepared accurately and readily depends on the extent to which the system has been devised to provide the necessary data. However, even if all transactions are recorded promptly and accurately, certain adjustments must be made before financial statements can be prepared. This chapter will treat of the necessary adjustments and of the general procedure to be followed in preparing financial statements, as well as of the statements to be included in a report.

ADJUSTING ENTRIES

Nature of Adjusting Entries

Statements may be classified into two groups: (1) those prepared during the fiscal year and (2) those prepared at the end of the fiscal year. While there is some variation in the method of procedure and the adjustments to be made in each case, the principles involved are the same. Accordingly, the entries for both types of statements will be considered together; but proper indication will be made in all instances where the procedure or adjustments differ.

The necessity for making adjustments before financial statements may be prepared arises out of the fact that certain items which have not as yet been recorded on the books must be taken into account in preparing financial statements, that other items which have been recorded as revenues or expenditures as of a certain period are partly applicable to another period, and that some assets must be written off at least in part and

charged against the revenues for the period. Specifically, the following items require adjustment:

1. Inventory
2. Uncollectible Accounts
3. Depreciation
4. Accrued Expenses
5. Accrued Income
6. Prepaid Expenses
7. Deferred Debits
8. Prepaid Revenues and Deferred Credits
9. Overhead Expenses

Inventory

Adjustments are frequently necessary to reconcile the inventory per books with the physical inventory. The manner in which the adjustment is made, and the entries involved, are discussed in Chapter 8.

Adjusting entries are frequently also necessary in order to include materials in transit in the closing inventory in those cases where the materials become the property of the utility as soon as shipped. The entry to record materials in transit is as follows:

Materials in Transit (134)	$4,000	
Accounts Payable (222)		$4,000
An entry in the General Journal to set up on books cost of materials in transit.		

When the materials are received, the above entry is reversed and the regular entry for recording purchases is made.

Uncollectible Accounts

There are two methods of recording losses from uncollectible accounts. One is to record such loss at the time it is determined that the account is uncollectible. Quite frequently, however, accounts are not determined to be uncollectible until long after the fiscal period during which they become receivable, the result being that the revenues of a certain fiscal period are charged with a loss resulting from revenues which accrued in another fiscal period.

A second method is to express the loss on uncollectible accounts as a percentage of sales revenues or as a percentage of accounts receivable. From past experience it is possible to determine the ratio of uncollectible accounts to sales for the fiscal period or to accounts receivable outstanding at the close of the fiscal period. A utility would have to consider its own experience in setting up the percentage to be applied. Obviously, however, the revenues and losses on accounts receivable of more than one year should be used as the basis for determining the percentage to be applied.

The amount of uncollectible accounts to be charged to a particular month will depend on the method set up in calculating losses on uncollectible accounts for the year. If losses are expressed as a percentage of operating revenues, it is necessary to multiply the operating revenues for the month by the percentage set up in order to arrive at the amount chargeable.

Where, however, the amount uncollectible for the year is based on the accounts receivable outstanding at the end of the year, the amount to be charged monthly is arrived at by taking one-twelfth of the total amount of uncollectibles charged for the preceding year. The same procedure is followed in determining the amount chargeable for any particular length of time less than a year. Thus the amount of uncollectibles to be charged for a five-month period is determined by taking five-twelfths of the total losses on uncollectible accounts charged last year.

In either case, that is, regardless of whether a percentage of gross revenues or of accounts receivable is used as the basis for charging losses on uncollectible accounts, the entry at the end of a month, assuming that the amount to be charged is the same under each method, would be:

Operating Expenses (502)	$100	
Reserve for Uncollectible Accounts (254)		$100

An entry in the General Journal to record charging estimated losses on accounts. SUBSIDIARY ACCOUNTS: *Debit* Uncollectible Accounts (784), $100.

However, where a percentage of accounts receivable is used, the losses will have been charged on the basis of the amount estimated as uncollectible at the end of the preceding year. At the end of this year, the amount of receivables outstanding

may be smaller, or conditions may be such that it is estimated the loss will be greater or smaller than last year even though the amount of accounts receivable outstanding is about the same.

To illustrate, assume that accounts receivable to the amount of \$60,000 were outstanding at the end of 1937 and that a reserve of 2 per cent was provided, or a total of \$1,200. The charge to each month of 1938 would, therefore, be \$100 ($1/12$ of \$1,200), thus making the charge \$1,100 for the first eleven months of 1938. Suppose, however, that the amount of receivables outstanding at the end of 1938 is \$70,000. Then the total amount of uncollectibles to be charged to that year should be \$1,400. However, since only \$1,100 will have been charged for the first eleven months, the charge for the twelfth month would be not \$100 but \$300.

Still another method of determining the adjustment at the end of the year is through aging the accounts receivable outstanding. This method is discussed in detail on page 131.

Depreciation

The method of arriving at the amount of depreciation to be charged annually was discussed in Chapter 11. It will, therefore, be sufficient merely to point out that depreciation to be charged for a month is arrived at by applying one-twelfth of the yearly rate to the value of fixed assets. However, where the unit of output method is used, the amount to be charged for a month is arrived at by multiplying the number of units for the month by the depreciation rate.

Accrued Expenses

Some expenses may have accrued at the time statements are prepared but may not have been recorded on the books because the liability was not yet due. Examples of such expenses are wages, salaries, interest, and taxes. To illustrate, assume that wages are paid on the 5th and 20th of each month, in which case wages for the period between the 20th and the end of the month will not be recorded until after the 5th of the next month. For statement purposes, however, it is essential that such wages and salaries be recorded as an expenditure of the current month.

There are two ways of recording the accrual of salaries and wages. Under the first method the entries are set up at the end of the month (or year) and reversed at the beginning of the next month (or year), the entries at the end of the month (or year) being as follows:

Operating Expenses (502)	$10,000	
Accrued Payroll (233)		$10,000
An entry in the General Journal to record accrued payroll.		

Postings to subsidiary accounts would be similar to those indicated in the explanation to the entry on pages 193 and 194. The reversing entry at the beginning of the following month (or year) would be as follows:

Accrued Payroll (233)	$10,000	
Operating Expenses (502)		$10,000
An entry in the General Journal to reverse entry setting up accrued payroll.		

The entries in the subsidiary accounts would also be reversed, and at the end of the payroll period an entry would be made in the Voucher Register debiting Operating Expenses (502) and crediting Vouchers Payable (222) for the amount of the payroll. Postings would be made from the voucher to the individual operating expense accounts.

Under the alternative method, the entry to record the amount of salaries or wages accrued at the end of a month (or year) is the same as the first entry illustrated above. No reversing entry is, however, made in this case at the beginning of the next month (or year). In fact, no entry is made until the end of the payroll period, at which time a voucher covering the payroll for the entire pay period is prepared and entered in the Voucher Register. The entry is as follows:

Accrued Payroll (233)	$10,000	
Operating Expenses (502)	5,000	
Vouchers Payable (222)		$15,000
An entry in the Voucher Register to record authorization of payroll for pay period. SUBSIDIARY ACCOUNTS: *Debit* the appropriate subsidiary operating expense account for salaries and wages from beginning of the current month (or year) to the end of the pay period.		

Entries in connection with accrued interest have been illustrated in Chapters 6 and 10. Entries charging the appropriate expense account and setting up the accrued liability should similarly be set up for all other accrued expenses.

Accrued Income

Accrued income represents revenues earned but not yet recorded. Some of the more common revenues for which adjusting entries must be made at the time statements are prepared are (1) rent receivable, (2) unbilled sales, and (3) interest receivable.

1. *Rent Receivable.* Rent is normally received in advance. Rent due but not yet received or recorded must be taken up on the books at the time statements are prepared. The entry is as follows:

Rents Receivable (129)	$500	
Rent for Lease of Utility Plant (509)		$500
An entry in the General Journal to record accrued rent for lease of plant.		

2. *Unbilled Sales.* Many utilities fail to take account of services rendered but not yet billed for. From a practical standpoint, it is felt that the sales included at the beginning of a fiscal period for services rendered in a previous period would be offset by the value of services at the end of a fiscal period which have been rendered but will not be billed until the following fiscal period. Since consumption varies widely—sometimes being highest in winter and at other times in summer—and since the expenses connected with rendering such services have been recorded in the accounting period during which rendered, such a practice may give rise to substantial error. Accordingly, it is advisable to take such sales into account in preparing financial statements, at least at the end of a fiscal year.

The following tabulation illustrates a method of determining unbilled sales to be set up on the records. It should be noted that all computations are on the basis of thousands of gallons.

Total Annual Pumpage in Thousands of Gallons....		1,637,629
Less—Water Used Without Compensation..	127,500	
Estimated Loss in Distribution..........	191,250	318,750
Consumption for the Year.......................		1,318,879

Less—Net Total Billed for Year:	%	*Amount*	
Metered Sales to General Customers	63.5	809,750	
Flat Rate Sales to General Customers	8.2	103,850	
Sales to Irrigation Customers	5.8	75,000	
Private Fire Protection	2.7	34,150	
Public Fire Protection	11.0	139,650	
Other Sales to Public Authorities	2.5	32,250	
Sales to Other Water Utilities	4.9	62,500	
Interdepartmental Sales	1.4	17,850	
Total Billings	100.0		1,275,000
Consumption Not Yet Billed (Thousands of Gallons)			43,879

Sales Not Yet Billed	%	Thousands of Gallons	Average Price per Thousand	Total
Metered Sales to General Customers	63.5	27,863.2	$ .13	$3,622.22
Flat Rate Sales to General Customers	8.2	3,598.1	.15	539.72
Sales to Irrigation Customers	5.8	2,545.0	.09	229.05
Private Fire Protection	2.7	1,184.7	.10	118.47
Public Fire Protection	11.0	4,826.7	.08	386.14
Other Sales to Public Authorities	2.5	1,097.0	.11	120.67
Sales to Other Water Utilities	4.9	2,150.0	.08	172.00
Interdepartmental Sales	1.4	614.3	.08	49.14
TOTALS	100.0	43,879.0	$ .119	$5,237.41

The first part of this computation is based on statistics compiled from the analysis of billings to customers, from other statistical information commonly compiled, and upon estimated losses in distribution. The second part of the computation has to do with the apportionment of the unbilled consumption in the same proportion between classes of income as already experienced during the year, and with placing a value on this apportioned gallonage (or cubic feet) on the basis of average prices. If the average price per unit of consumption does not include service charges, additional columns should be provided to indicate the amount of such estimated charges.

The entry to record unbilled sales is as follows:

Accrued Utility Revenues (130)	$5,237.41	
Operating Revenues (501)		$5,237.41

An entry in the General Journal to record accrued unbilled sales at the end of a fiscal period. Credit subsidiary accounts as follows:

Metered Sales to General Customers (601)	$3,622.22
Flat Rate Sales to General Customers (602)	539.72
Sales to Irrigation Customers (603)	229.05
Private Fire Protection (604) ..	118.47
Public Fire Protection (605)	386.14
Other Sales to Public Authorities (606)	120.67
Sales to Other Water Utilities (607)	172.00
Interdepartmental Sales (608) ..	49.14

3. *Interest Receivable.* Where the interest receipt date is later than the date as of which statements are to be prepared, the amount of interest accrued since the last interest date should be set up. The entry is as follows:

Interest and Dividends Receivable (128)	$500	
Interest Revenues (524)		$500

An entry in the General Journal to record accrued interest.

Prepaid Expenses

Certain expenses are paid in advance and may cover more than one accounting period, in which case two procedures are possible. One is to record the amount as an expense at the time incurred and to set up the unapplied portion as an asset at the time statements are prepared. The other is to set up the expense as an asset at the time incurred and to charge off an appropriate portion thereof as an expense of the accounting period to which applicable. Some of the more common prepaid expenses are those involving insurance, rent, and interest.

The following entries illustrate the accounting procedure (1) under the method whereby expenditures are first set up as an asset and (2) under the method whereby expenses are recorded as such and the amount prepaid set up as an asset at the time statements are prepared. Rent expense has been chosen for purposes of illustration, but the entries for the other expenses can be readily derived from the illustrations. (See also Chapter 10.)

Assuming that rent is paid for a three-month period, the entry under the first method would be:

Prepaid Rent (132.1)	$300	
Vouchers Payable (222)		$300

An entry in the Voucher Register to record authorization to prepay rent.

Vouchers Payable (222)	$300	
Cash (120)		$300

An entry in the Check Register to record payment of voucher.

At the end of the first month, an entry charging rent expense applicable to that month would be made as follows:

Operating Expenses (502)	$100	
Prepaid Rent (132.1)		$100

An entry in the General Journal to record rent expense for one month. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $100.

A similar entry would be made at the end of each month or other period for which statements may be prepared, apportioning a proper share of the prepaid expense to the period under consideration.

Under the second method, the entry at the time rent is paid is as follows:

Operating Expenses (502)	$300	
Vouchers Payable (222)		$300

An entry in the Voucher Register authorizing payment of rent. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $300.

Vouchers Payable (222)	$300	
Cash (120)		$300

An entry in the Check Register to record payment of voucher.

At the end of the month an entry would be made setting up as an asset the portion prepaid as of that date, the entry being:

Prepaid Rent (132.1)	$200	
Operating Expenses (502)....................		$200

An entry in the General Journal setting up the amount of rent prepaid at this date. SUBSIDIARY ACCOUNTS: *Credit* Rents (785), $200.

At the beginning of the next month, the entry would be reversed as follows:

Operating Expenses (502)	$200	
Prepaid Rent (132.1)		$200

An entry in the General Journal to reverse entry setting up prepaid rent. SUBSIDIARY ACCOUNTS: *Debit* Rents (785), $200.

It is evident that the result would be the same under each method.

Deferred Debits

Deferred debits are similar to prepaid expenses in the sense that in both cases the expenditure is incurred in one period but is prorated among several periods. One of the chief differences between the two is that prepaid expenses represent those expenses which recur regularly from year to year in the ordinary operations of the business, whereas deferred debits represent charges which do not recur regularly. Examples of deferred debits are unamortized bond discount and expense and extraordinary property losses not provided for by a reserve. The National Association of Railroad and Utilities Commissioners also includes clearing accounts in this classification although the items included in the latter represent regularly recurring expenses. However, since the accounting procedure for both prepaid expenses and deferred debits is somewhat similar, the validity of financial statements is not thereby affected.

Other deferred debits are preliminary survey and investigation charges and retirement work in progress. These are to be distinguished from the deferred debits enumerated above in that they do not ordinarily constitute deductions from income. Preliminary survey and investigation charges are considered part of the cost of the project to which applicable; it is only if the survey does not result in the construction of a proposed project that such charges are treated as deductions from income. Retirement work in progress represents expenditures which will usually be charged against a reserve for depreciation.

The method of setting up the various deferred debits referred to above and of amortizing those subject to amortization, is indicated in other parts of the manual.[1]

[1] Clearing Accounts, Chapter 12; Extraordinary Property Losses, Chapter 17; Retirement Work in Progress, Chapter 17; Bond Discounts, Chapter 18.

Prepaid Revenues and Deferred Credits

Prepaid revenues and deferred credits represent receipts subject to refund or revenues received in one period but applicable wholly or in part to another period. Although a distinction might be made here, too, between prepaid revenues (that is, revenues received in the ordinary course of business) and deferred credits (revenues not received in the ordinary operations of the utility), examples of each are so few that the two are treated together here. Examples of prepaid revenues are rent received in advance and advance payments by customers for water not yet consumed. Examples of deferred revenues received in advance are customers' advances for construction which are to be refunded either wholly or in part and unamortized premium on bonds.

The entries to record recurring revenues received in advance will be illustrated first. For example, at the time an advance rent payment is received, the entry is:

Cash (120)	\$500	
Rent Received in Advance (242)		\$500
An entry in the Cash Receipts Register to record receipt of rent in advance.		

At the end of an accounting period, an entry is made crediting that period with the proper share of rent, the entry being:

Rent Received in Advance (242)	\$100	
Rent for Lease of Utility Plant (509)		\$100
An entry in the General Journal to transfer the earned portion of rent received in advance to revenues.		

Similarly, at the time advance payments for services are received from customers, the following entry is made:

Cash (120)	\$5,000	
Revenues Received in Advance (243)		\$5,000
An entry in the Cash Receipts Register to record the receipt of water revenues from customers in advance.		

When the time for preparing statements arrives, an entry is made apportioning the proper amount of revenues applicable to the period to be covered by the statements. The entry is:

Revenues Received in Advance (243)	$3,000	
Operating Revenues (501)		$3,000

An entry in the General Journal to record the amount of water revenues received in advance applicable to an accounting period. SUBSIDIARY ACCOUNTS: *Credit* Metered Sales to General Customers (601), $2,000; Flat Rate Sales to General Customers (602), $1,000.

Customers' advances for construction represent a common form of deferred credit. At the time such advances are received, the entry is as follows:

Cash (120)	$25,000	
Customers' Advances for Construction (241)		$25,000

An entry in the Cash Receipts Register to record advances from customers for construction purposes to be refunded either wholly or in part.

Assuming that part of the advances are to be refunded and part retained by the utility, the entry at the time the portion to be retained by the utility is determined is as follows:

Customers' Advances for Construction (241)	$10,000	
Contributions in Aid of Construction (265)		$10,000

An entry in the General Journal to record portion of customers' advances to be retained.

Refunds are recorded by the following entry:

Customers' Advances for Construction (241) ...	$5,000	
Vouchers Payable (222)		$5,000

An entry in the Voucher Register authorizing refund of customers' advances.

Vouchers Payable (222)	$5,000	
Cash (120)		$5,000

An entry in the Check Register to record payment of a voucher.

Sometimes provision is made for applying amounts periodically to the credit of the customer's account, in which case an entry is made debiting Customers' Advances for Construction (241) and crediting Accounts Receivable (125), with proper postings to the subsidiary accounts.

Distributing Overhead Expenses

The methods of distributing overhead expenses are discussed in detail in Chapters 12 and 13.

Procedure in Preparing Financial Statements

Recording Adjusting Entries

As soon as adjusting entries have been posted to the proper accounts, the books are ready for the preparation of financial statements. However, before proceeding with the preparation of statements the mathematical accuracy of the bookkeeping work must be proved. Such proof can be secured by taking a trial balance, that is, listing all the general accounts with the debit balances in one column and the credit balances in another. If the total of the column containing the debit balances is equal to the total of the balances in the credit column, the books are said to be in balance and debit and credit postings are assumed to have been properly made. If they are not in agreement, it is evident that there is some error which must be found and corrected.

It should be noted that the trial balance is taken of the general ledger accounts. It is important, however, to see that the balance of each controlling account is in agreement with the total of the balances of the individual subsidiary accounts which it controls. The balances of the accounts in each subsidiary ledger should, therefore, be totaled and compared with the balance of the corresponding controlling account.

The trial balance should be entered on a work sheet, a form for which is illustrated in Figure 110.[2] A work sheet, although not essential in preparing financial statements, is helpful. After the totals of "Trial Balance" columns are found to be correct, the account balances are distributed respectively to the "Income Statement" or "Balance Sheet" columns, depending on whether such accounts go to make up the balance sheet or the income statement. The difference between the debit and credit balances of the income statement represents the net income (or loss in case the debit balances are greater than the balances in the credit column) and is also shown in the credit column of the balance sheet (debit column in case of a loss).

[2] All figures of this chapter are grouped together at the end of the chapter.

Closing the Books

The books are usually closed only at the end of a fiscal year. By closing the books is meant transferring the balances in both the revenue and expense accounts into an income account, thereby determining the net income for a period. The balance of the Net Income account is then transferred to surplus, so that only balance sheet account balances are carried over into the next year. Frequently some revenue or expense account balances may first be transferred to another account whose balance is in turn closed into the Net Income account.

The reason the account balances of the income and expense accounts are closed out is that revenues and expenditures are accumulated for a year, and if these balances were to be carried forward, it would impede the work of determining the revenues and expenses for a succeeding year. On the other hand, in the case of monthly statements, it is usually not only desirable to know what the revenues and expenses for the month have been but also the revenues and expenses from the beginning of the year to date. If the books were to be closed, the preparation of statements showing data for more than one month would be made more complicated. Accordingly, closing entries are not prepared for such period. This does not prevent the determination of net income for the month.

The books are closed by means of closing entries which are entered in the General Journal and posted to the accounts. The following is an illustration of a closing journal entry:

Operating Revenues (501)	$540,000
Income from Utility Plant Leased to Others (508)	15,000
Rent for Lease of Utility Plant (509)	5,000
Income from Merchandising, Jobbing, and Contract Work (520)	5,000
Income from Non-Utility Operations (521)	2,000
Revenues from Lease of Other Physical Property (522)	5,000
Dividend Revenues (523)	2,000
Interest Revenues (524)	2,000
Revenues from Sinking and Other Funds (525)	5,000
Miscellaneous Non-Operating Revenues (526)	2,000

Amortization of Premium on Debt—Cr. (532)	1,000	
Interest Charged to Construction—Cr. (536)	2,000	
Operating Expenses (502)		$415,000
Depreciation (503)		33,000
Amortization of Limited-Term Utility Investments (504)		5,000
Property Losses Chargeable to Operations (506)		2,000
Taxes (507)		25,000
Non-Operating Revenue Deductions (527)		6,000
Interest on Long-Term Debt (530)		34,000
Amortization of Debt Discount and Expense (531)		1,000
Taxes Assumed on Interest (533)		500
Other Interest Charges (535)		1,500
Miscellaneous Amortization (537)		500
Miscellaneous Income Deductions (538)		1,000
Net Income (539)		61,500

An entry in the General Journal to record closing revenues and expenses into a net income account and to determine net income. Subsidiary accounts to be debited:

Metered Sales to General Customers (601)	$355,000
Flat Rate Sales to General Customers (602)	50,000
Sales to Irrigation Customers (603)	20,000
Private Fire Protection (604)	10,000
Public Fire Protection (605)	40,000
Other Sales to Public Authorities (606)	10,000
Sales to Other Water Utilities (607)	20,000
Interdepartmental Sales (608)	5,000
Rent from Water Property (610)	5,000
Interdepartmental Rents (611)	6,000
Customers' Forfeited Discounts and Penalties (612)	2,000
Servicing of Customers' Installations (614)	5,000
Miscellaneous Water Revenues (615)	2,000
Merchandising, Jobbing, and Contract Work (616)	10,000
Total As Above	$540,000

Postings would also be made to all the subsidiary accounts affected. Since, however, these are too numerous to list here,

only the subsidiary operating revenue accounts have been included in the explanation of the above journal entry.

Certain reserves may have to be set up out of income before the balance is transferred to surplus. Assuming that a sinking fund reserve is set up, the entry is as follows:

Miscellaneous Reservations of Net Income (540)	$20,000	
Reserve for Retirement of Sinking Fund Bonds (259)		$20,000
An entry in the General Journal to record setting up sinking fund reserve out of income.		

The balance in the Miscellaneous Reservations of Net Income account (540) is then transferred to the Net Income account (539) by the following entry:

Net Income (539)	$20,000	
Miscellaneous Reservations of Net Income (540)		$20,000
An entry in the General Journal to record closing out of balance of Miscellaneous Reservations of Net Income account into Net Income account.		

The final closing entry is that made to transfer the balance in the Net Income account into surplus. The entry is:

Net Income (539)	$41,500	
Credit Balance Transferred from Income Account (400)		$41,500
An entry in the General Journal to record closing out of credit balance of Net Income account into surplus.		

Financial Reports

Types of Financial Reports

There are two types of financial reports: administrative and public. Administrative financial reports, as their name implies, are used for purposes of administration; public financial reports are those issued for the use of the public. The two, however, are not necessarily as distinct as the classification here might seem to suggest, many of the statements which are useful to administrators also being included in a public report.

One distinction between the two is that many of the statements prepared for the administrator are not included in reports to the public. A second distinction is that some of the statements included in the public report are less detailed than the same statements as submitted to the administrator. The third distinction is that administrative reports are prepared at more frequent intervals. Public financial reports will be discussed first, followed by a discussion of administrative reports.

Classification of Public Financial Reports

Public financial reports may be classified into two classes, namely, monthly and annual reports. Monthly financial reports are similar to annual reports except that they contain fewer statements. Accordingly, attention will be directed primarily to outlining the contents and illustrating the statements of the annual public financial report. Indication will also be made, however, of the contents of the monthly report and the points of similarity and difference between the latter and the annual financial report.

Contents of Annual Financial Report

The following is an outline of the contents of an annual financial report:

I. Financial Statements Section

A. *Principal Statements*

1. Balance Sheet. Figure 111.
2. Income Statement. Figure 112.

B. *Budgetary Statements*

1. Statement of Estimated Net Income Compared with Actual. Figure 113.

C. *Subsidiary Schedules Supporting Balance Sheet Accounts*

1. Detailed Statement of Utility Plant. Figure 114.
2. Analysis of Changes in Utility Plant. Figure 115.
3. Statement of Work in Progress. Figure 116.
4. Statement of Cash Receipts, Disbursements, and Balances. Figure 117.

5. Analysis of Changes in Sinking Fund Balances. Figure 118.
6. Statement of Bonds Outstanding. Figure 119.
7. Analysis of Changes in Bonds Outstanding. Figure 120.
8. Analysis of Changes in Earned Surplus. Figure 121.

D. *Subsidiary Schedules Supporting Income Accounts*

1. Detailed Statement of Operating Revenues. Figure 122.
2. Detailed Statement of Operating Expenses. Figure 123.

E. *Subsidiary Schedules Supporting Budgetary Statements*

1. Statement of Estimated Operating Revenues Compared with Actual. Figure 124.
2. Statement of Estimated Operating Expenses Compared with Actual. Figure 125.

II. Financial Statistics Section

1. Cost of Pumping Per Million of Gallons for a Period of Ten Fiscal Years. Figure 126.
2. Cost of Purification Per Million of Gallons for a Period of Ten Fiscal Years. Figure 127.
3. Cost of Transmission and Distribution Per Million of Gallons Pumped for a Period of Ten Fiscal Years. Figure 128.
4. Cost Per Foot of Main Laid by Size for a Period of Ten Fiscal Years. Figure 129.
5. Operating Revenues, Operating Revenue Deductions, Net Operating Revenues, and Net Income for a Period of Ten Fiscal Years. Figure 130.
6. Debt Service Charges for a Period of Twenty Fiscal Years. Figure 131.

It should be noted that the annual financial report here outlined consists of two sections, namely, a section devoted to financial statements and one devoted to financial statistical data. The difference between the two lies primarily in the fact that the statistical section covers a period of several years and the data are presented in condensed form and, in most cases, expressed in terms of unit costs.

A. *Principal Statements (Figures 111 and 112).* Every report must contain at least a balance sheet and an income statement. As far as practicable data should be presented for a two year period so that a comparison can be made between the figures for the current and preceding years.

B. *Budgetary Statements (Figure 113).* Practically every municipal utility is required to prepare a budget. The purpose of budgetary statements is to compare actual operations with estimates made in the budget. Private utilities operating on a budget also prepare these statements although in such cases the statements are not usually included in the public report. The statements are discussed in greater detail in Chapter 20.

C. *Subsidiary Schedules Supporting Balance Sheet Accounts (Figures 114–121).* The purpose of these schedules is to give more information about some of the accounts carried in the balance sheet. As was indicated in Chapter 3, accounts may be classified in accordance with whether they are carried in the General Ledger or in subsidiary ledgers. The balance sheet contains the general ledger accounts, and since it is usually desired to have more information about some of the accounts shown, subsidiary schedules compiled from the data contained in subsidiary accounts are prepared.

Indication has already been made that data for the two principal statements may be shown for a period of two years. The same holds true with the subsidiary schedules. However, even a comparative balance sheet merely shows the net changes in assets, liabilities, reserves, and surplus. It does not analyze such changes, as do some of the subsidiary schedules. For example, even a comparative balance sheet shows only the net change in cash between two years; that is, it may show that cash at the end of the current year is greater or smaller than cash at the end of the preceding year (or the beginning of the current year). On the other hand, the subsidiary schedule illustrated in Figure 117 shows not only the cash balances at the beginning and end of the year but also the sources of receipts and objects of disbursements.

It is thus evident that schedules may be classified in accordance with the detail they show about the asset, liability, reserve, or surplus accounts and also in accordance with the changes they show in each of these as between two statement dates.

Figure 114 illustrates a schedule of the former type and Figure 117 a schedule of the latter type. The same schedule may show greater detail and may also analyze the changes which have taken place, Figure 115 being an example of this type of subsidiary statement.

Attention is called to the fact that some of the schedules showing greater detail about balance sheet accounts may be omitted if the amount of detail is so small that it can be included in the balance sheet without making this statement unduly complicated. Schedules showing changes may be omitted if no significant changes have taken place during the year.

All balance sheet controlling accounts which are supported by a subsidiary schedule should have a notation to that effect on the line on which the account is carried. Similarly, reference should be made on the subsidiary statement to the controlling account which it supports. The same also holds true for subsidiary statements supporting income accounts, discussed below.

D. *Subsidiary Schedules Supporting Income Accounts (Figures 122 and 123)*. As in the case of balance sheet accounts, income accounts carried in the General Ledger may be supported by subsidiary accounts showing greater details about revenues and expenditures. Although expenditure accounts will almost invariably be sufficiently numerous to warrant the preparation of a separate schedule, revenue accounts may, on the other hand, be so few in number as to be included in the principal statement itself rather than in a separate schedule.

E. *Subsidiary Schedules Supporting Budgetary Statements (Figures 124 and 125)*. These are similar to the subsidiary schedules supporting income accounts except that they show not only actual revenues and expenditures but estimates as well.

Contents of Monthly Public Financial Report

Monthly financial statements are prepared primarily for use of administrators. However, some of the statements might be compiled in a report to be issued to the public. The following are some of the statements to be included in such a report:

A. *Principal Statements*

1. *Balance Sheet.* This statement would be similar to the balance sheet illustrated in Figure 111 except that the data

would show the financial condition of the utility at the end of the current month and at the end of the corresponding month a year ago.

2. *Income Statement.* This statement would be similar to that illustrated in Figure 112 except that the data would be shown for the current month and the corresponding month a year ago and possibly also for the current year to date and for a corresponding period of the preceding year. Specifically the statement would be headed somewhat as follows:

Account Titles	Current Month	Corresponding Month of Preceding Year	Current Year To Date	Corresponding Period of Preceding Year

B. *Budgetary Statements*

1. *Statement of Actual Revenues Compared with Estimates.* See Figure 144.

2. *Statement of Actual Expenses Compared with Estimates.* See Figure 145.

C. *Subsidiary Statements Supporting Balance Sheet Accounts*

1. *Statement of Cash Receipts, Disbursements, and Balances.* This statement is similar to that illustrated in Figure 117 except that the data would be shown for the current month and the corresponding month of the preceding year.

D. *Subsidiary Statements Supporting Income Accounts*

1. *Detailed Statement of Operating Revenues.* The data to be shown in this statement are similar to those exhibited in Figure 122 except that they would cover the current month, the corresponding month a year ago, and possibly also the current year to date as well as the corresponding period a year ago. The statement would be headed somewhat as follows:

Account Titles	Current Month	Corresponding Month of Preceding Year	Current Year To Date	Corresponding Period of Preceding Year

2. *Detailed Statement of Operating Expenses.* This statement would be similar to that exhibited in Figure 123 with the following exception: The data would be shown for the current month, the corresponding month of the preceding year, and possibly also for the current year to date as well as the corresponding period a year ago.

Administrative Reports

The term "report" may be used in two senses. In one sense a report is a collection of statements; in another the terms "report" and "statement" are synonymous. In speaking of reports to the public, the term "report" was used in the sense of a collection of related statements which, taken together, show the financial condition and financial operations of the utility. An administrator may be concerned with but one activity or a particular phase of one activity, and in his case the report may consist of but a single financial statement. Accordingly, in speaking of administrative reports, no attempt will be made to indicate the kind of statements that should go into reports to various types of administrators. Rather, the attempt will be to indicate the types of statements that are needed for administrative use.

Administrative statements may be classified according to whether they are prepared daily, weekly, monthly, annually, and at other periods. It must be kept in mind, however, that the frequency with which reports are prepared depends on the size of the utility and the magnitude of operations. A report that may be prepared daily in a large utility may need to be prepared only monthly in the case of a small utility. Accordingly, it must be kept in mind that the classifications listed below are subject to modifications. In most cases, the statements listed have already been illustrated in some parts of the manual and proper reference is made to them below.

Classification of Administrative Statements

1. *Daily Statements*
   a. Daily Report of Cash Collections. Figures 34 and 35.
   b. Daily Report of Gas, Oil, and Supplies Issued. Figure 75.
   c. Daily Labor Report—Heavy Construction Jobs. Figure 90.

   d. Daily Labor Report—Light Construction and Maintenance Work. Figure 92.
   e. Equipment Operator's Daily Report. Figure 93.

2. *Weekly Statements*
   a. Inventory of Gas and Oil. Figure 76.

3. *Monthly Statements*
   a. The financial statements included under monthly public financial report. See pages 406–408.
   b. Monthly Summary of Gas, Oil, and Supplies Used. Figure 73.
   c. Monthly Summary of Equipment Maintenance & Repair Labor. Figure 78.
   d. Monthly Summary of Repair Parts Used. Figure 80.
   e. Monthly Summary of Equipment Overhead Expenses. Figure 81.
   f. Monthly Summary of Equipment Miles and Hours Run. Figure 82.
   g. Equipment Work and Cost Statement. Figure 83.
   h. Summary Report of Materials Used on Heavy Construction Jobs. Figure 89.
   i. Monthly Summary of Unit and Labor Costs. Figure 91.
   j. Summary of Equipment Charges to Heavy Construction Jobs. Figure 94.
   k. Summary of Equipment Charges to Light Construction and to Maintenance Jobs. Figure 95.
   l. Construction Work and Cost Statement—Completed Jobs. Figure 96.
   m. Monthly Summary of Completed Construction. Figure 97.
   n. Monthly Report of Operation Costs. Figure 98.
   o. Monthly Cash Forecast. This statement will be similar to that illustrated in Figure 141 except that it will be for a three months' period.

4. *Annual Statements*
   a. Statements included in Annual Public Financial Report. See pages 403 and 404.
   b. Detailed statistical information from customer accounting office. See for example, Figure 24.
   c. Budget Document. See Chapter 20.

FIGURE 110 *

XYZ WATER WORKS

WORK SHEET—DECEMBER 31, 19—

Name	Adjusted Trial Balance		Income Statement		Balance Sheet	
	Debit	*Credit*	*Debit*	*Credit*	*Debit*	*Credit*
Utility Plant in Service	$2,007,900				$2,007,900	
Construction Work in Progress	70,000				70,000	
Other Investments—Stocks & Bonds	58,600				38,600	
Sinking Funds	229,500				249,500	
Cash	131,200				131,200	
Special Deposit—Interest	40,000				40,000	
Working Funds	800				800	
Notes Receivable	9,000				9,000	
Accounts Receivable	150,000				150,000	
Accrued Revenues—Unbilled Sales	13,300				13,300	
Materials & Supplies	35,000				35,000	
Prepayments	5,000				5,000	
Interest	200				200	
Unamortized Bond Discount	3,800				3,800	
Engineering Development Expense	10,900				10,900	
Retirement Work in Progress	365				365	
Common Cap. Stock (or Mun. Equity)		$ 600,000				$ 600,000
Premium on Capital Stock		20,000				20,000
Bonds		1,068,000				1,068,000
Notes Payable		10,000				10,000
Accounts Payable		50,000				50,000
Customers' Deposits		26,000				26,000
Taxes Accrued		35,000				35,000
Interest Accrued		42,500				42,500
Wages Accrued		5,000				5,000

Contracts Payable—Percentage Retained		$ 25,000				$ 25,000
Revenues Collected in Advance		9,300				9,300
Reserve for Depreciation of Utility Plant		335,000				335,000
Reserve for Amortization of Limited Term Utility Investments		25,000				25,000
Reserve for Uncollectible Accounts		7,500				7,500
Sinking Fund Reserve		229,500				249,500
Contributions in Aid of Construction		25,051				25,051
Earned Surplus		191,214				191,214
Operating Revenue		540,000		$540,000		
Operating Expenses	$ 415,000		$415,000			
Depreciation	33,000		33,000			
Amortization of Limited Term Investments	5,000		5,000			
Property Losses Chargeable to Operations	2,000		2,000			
Taxes	25,000		25,000			
Income from Utility Plant Leased		15,000		15,000		
Rent for Lease of Plant		5,000		5,000		
Income from Merchandising		5,000		5,000		
Income from Non-Utility Operations		2,000		2,000		
Revenues from Lease of Other Property		5,000		5,000		
Dividend Revenues		2,000		2,000		
Interest Revenues		2,000		2,000		
Sinking Fund Revenues		5,000		5,000		
Miscellaneous Non-Operating Revenues		2,000		2,000		
Non-Operating Revenue Deductions	6,000		6,000			
Interest on Long-Term Debt	34,000		34,000			
Amortization of Debt Discount	1,000		1,000			
Amortization of Premium on Debt		1,000		1,000		
Taxes Assumed on Interest	500		500			
Other Interest Charges	1,500		1,500			
Interest Charged to Construction		2,000		2,000		
Miscellaneous Amortization	500		500			
Miscellaneous Income Deductions	1,000		1,000			
Net Income			61,500			41,500
TOTALS	$3,290,065	$3,290,065	$586,000	$586,000	$2,765,565	$2,765,565

* In the present and all succeeding statements, no significance whatever should be attached to the amounts used since they are all purely fictitious.

Figure 111

XYZ WATER WORKS

BALANCE SHEET
At Close of Fiscal Years

Assets

	Current Year	Preceding Year	Increase or Decrease *
Utility Plant:			
Utility Plant in Service (Figures 114 and 115)	$2,007,900	$1,891,500	$116,400
Construction Work in Progress (Figure 116)	70,000	149,000	79,000*
Total Utility Plant	$2,077,900	$2,040,500	$ 37,400
Investment and Fund Accounts:			
Other Investments—Stocks and Bonds	$ 38,600	$ 38,000	$ 600
Sinking Funds (Figure 118)	249,500	230,000	19,500
Total Investment and Fund Accounts	$ 288,100	$ 268,000	$ 20,100
Current and Accrued Assets:			
Cash (Figure 117)	$ 131,200	$ 127,500	$ 3,700
Special Deposits—Interest	40,000	35,000	5,000
Working Funds	800	800	......
Notes Receivable	9,000	9,500	500*
Accounts Receivable	150,000	155,914	5,914*
Accrued Utility Revenues—Unbilled Sales	13,300	14,000	700*
Materials and Supplies	35,000	35,500	500*
Prepayments	5,000	4,500	500
Other Current and Accrued Assets—Interest	200	200	......
Total Current and Accrued Assets	$ 384,500	$ 382,914	$ 1,586
Deferred Debits:			
Unamortized Bond Discount	$ 3,800	$ 3,900	$ 100*
Engineering Development Expense	10,900	10,800	100
Retirement Work in Progress	365	400	35*
Total Deferred Debits	$ 15,065	$ 15,100	$ 35*
TOTAL ASSETS	$2,765,565	$2,706,514	$ 59,051

FIGURE 111 (Continued)

XYZ WATER WORKS

BALANCE SHEET

AT CLOSE OF FISCAL YEARS

LIABILITIES, RESERVES, AND NET WORTH

	Current Year	Preceding Year	Increase or Decrease *
CAPITAL STOCK:			
Common Capital Stock—12,000 shares, $50 par	$ 600,000	$ 600,000	......
Premium on Capital Stock	20,000	20,000	......
TOTAL CAPITAL STOCK	$ 620,000	$ 620,000	......
LONG-TERM DEBT:			
Bonds (Figures 119 and 120)	$1,068,000	$1,103,000	$ 35,000*
CURRENT AND ACCRUED LIABILITIES:			
Notes Payable	$ 10,000	$ 9,500	$ 500
Accounts Payable	50,000	29,000	21,000
Customers' Deposits	26,000	25,600	400
Taxes Accrued	35,000	35,800	800*
Interest Accrued	42,500	44,500	2,000*
Other Current and Accrued Liabilities:			
Wages	5,000	4,000	1,000
Contracts Payable—Percentage Retained	25,000	28,000	3,000*
TOTAL CURRENT AND ACCRUED LIABILITIES	$ 193,500	$ 176,400	$ 17,100
DEFERRED CREDITS:			
Other Deferred Credits—Revenue Collected in Advance	$ 9,300	$ 9,400	$ 100*
RESERVES:			
Reserve for Depreciation of Utility Plant	$ 335,000	$ 325,000	$ 10,000
Reserve for Amortization of Limited-Term Utility Investments	25,000	23,500	1,500
Reserve for Uncollectible Accounts	7,500	6,500	1,000
Sinking Fund Reserve (Figure 119)	249,500	229,500	20,000
TOTAL RESERVES	$ 617,000	$ 584,500	$ 32,500
CONTRIBUTIONS IN AID OF CONSTRUCTION	$ 25,051	$ 22,000	$ 3,051
SURPLUS:			
Earned Surplus (Figure 121)	$ 232,714	$ 191,214	$ 41,500
TOTAL LIABILITIES, RESERVES, AND NET WORTH	$2,765,565	$2,706,514	$ 59,051

FIGURE 112

XYZ WATER WORKS

INCOME STATEMENT

FOR FISCAL YEARS

	Current Year	Preceding Year	Increase or Decrease *
UTILITY OPERATING INCOME:			
Operating Revenues (Figure 122)	$540,000	$520,000	$ 20,000
Less—Operating Revenue Deductions:			
Operating Expenses (Figure 123)	$415,000	$400,000	$ 15,000
Depreciation	33,000	30,000	3,000
Amortization of Investments	5,000	4,000	1,000
Property Losses Chargeable to Operations	2,000	......	2,000
Taxes	25,000	26,000	1,000*
Total Operating Revenue Deductions	$480,000	$460,000	$ 20,000
Net Operating Revenues	$ 60,000	$ 60,000	......
Income from Utility Plant Leased	$ 15,000	$ 10,000	$ 5,000
Rent for Lease of Utility Plant	5,000	6,000	1,000*
UTILITY OPERATING INCOME	$ 80,000	$ 76,000	$ 4,000
OTHER INCOME:			
Income from Merchandising	$ 5,000	$ 5,500	$ 500*
Income from Non-Utility Operations	2,000	1,500	500
Revenues from Lease of Other Property	5,000	5,000	......
Dividend Revenues	2,000	......	2,000
Interest Revenues	2,000	2,000	......
Revenue from Sinking Funds	5,000	4,500	500
Miscellaneous Non-Operating Revenues	2,000	1,500	500
	$ 23,000	$ 20,000	$ 3,000
Less—Non-Operating Revenue Deductions	6,000	5,000	1,000
Total Other Income	$ 17,000	$ 15,000	$ 2,000
GROSS INCOME	$ 97,000	$ 91,000	$ 6,000
OTHER DEDUCTIONS:			
Interest on Long-Term Debt	$ 34,000	$ 35,000	$ 1,000*
Amortization of Debt Discount	1,000	1,000	......
Amortization of Premium	1,000†	1,000†	......
Taxes Assumed on Interest	500	400	100
Other Interest Charges	1,500	1,000	500
Interest Charged to Construction	2,000†	1,000†	1,000*
Miscellaneous Amortization	500	400	100
Miscellaneous Income Deductions	1,000	500	500
Total Income Deductions	$ 35,500	$ 36,300	$ 800*
NET INCOME	$ 61,500	$ 54,700	$ 6,800
Miscellaneous Reservations of Net Income	20,000	20,000	......
BALANCE TRANSFERRED TO SURPLUS (Figure 121)	$ 41,500	$ 34,700	$ 6,800

† Red

FIGURE 113

XYZ WATER WORKS

STATEMENT OF ESTIMATED NET INCOME COMPARED WITH ACTUAL FOR FISCAL YEAR

	Estimated	Actual	Excess of Estimated over Actual or Vice Versa *
UTILITY OPERATING INCOME:			
Operating Revenues (Figure 124)	$550,000	$540,000	$ 10,000
Less—Operating Revenue Deductions:			
Operating Expenses (Figure 125)	$419,800	$415,000	$ 4,800
Depreciation	33,000	33,000	......
Amortization of Investments	5,000	5,000	......
Property Losses Chargeable to Operations	......	2,000	2,000*
Taxes	26,000	25,000	1,000
Total Operating Revenue Deductions	$483,800	$480,000	$ 3,800
Net Operating Revenues	$ 66,200	$ 60,000	$ 6,200
Income from Utility Plant Leased	14,000	15,000	1,000*
Rent for Lease of Utility Plant	4,000	5,000	1,000*
UTILITY OPERATING INCOME	$ 84,200	$ 80,000	$ 4,200
OTHER INCOME:			
Income from Merchandising	$ 4,000	$ 5,000	$ 1,000*
Income from Non-Utility Operations	1,500	2,000	500*
Revenues from Lease of Other Property	4,500	5,000	500*
Dividend Revenues	1,500	2,000	500*
Interest Revenues	1,500	2,000	500*
Revenue from Sinking Funds	5,500	5,000	500
Miscellaneous Non-Operating Revenues	1,800	2,000	200*
	$ 20,300	$ 23,000	$ 2,700*
Less—Non-Operating Revenue Deductions	5,000	6,000	1,000*
Total Other Income	$ 15,300	$ 17,000	$ 1,700*
GROSS INCOME	$ 99,500	$ 97,000	$ 2,500
OTHER DEDUCTIONS:			
Interest on Long Term Debt	$ 34,000	$ 34,000	$ .....
Amortization of Debt Discount	1,000	1,000	......
Amortization of Premium	1,000†	1,000†	......
Taxes Assumed on Interest	500	500	......
Other Interest Charges	1,500	1,500	......
Interest Charged to Construction	1,800†	2,000†	200
Miscellaneous Amortization	500	500	......
Miscellaneous Income Deductions	1,100	1,000	100
Total Income Deductions	$ 35,800	$ 35,500	$ 300
NET INCOME	$ 63,700	$ 61,500	$ 2,200
Miscellaneous Reservations of Net Income	20,000	20,000	......
BALANCE TRANSFERRED TO SURPLUS	$ 43,700	$ 41,500	$ 2,200

† Red

FIGURE 114

XYZ WATER WORKS

DETAILED STATEMENT OF UTILITY PLANT

AT CLOSE OF FISCAL YEAR

Name	Intangible Plant	Land	Structures	Equipment	Total
Source of Supply	......	$149,000	$285,000	$ 85,000	$ 519,000
Power and Pumping	......	22,000	35,000	175,000	232,000
Purification	......	35,000	35,000	165,000	235,000
Transmission	......	25,000	......	250,000	275,000
Distribution	$50,000	5,000	20,000	572,000	647,000
Customers' Accounting and Collecting	......	4,000	10,000	28,000	42,000
Administrative and General	......	20,000	15,000	22,900	57,900
TOTAL COST (Figure 111)	$50,000	$260,000	$400,000	$1,297,900	$2,007,900

FIGURE 115

XYZ WATER WORKS

ANALYSIS OF CHANGES IN UTILITY PLANT

FOR FISCAL YEAR

	Beginning of Year	Additions	Retirements	End of Year	Reserves for Depreciation or Amortization * End of Year
INTANGIBLE PLANT:					
Organization Expense	$ 50,000	......	......	$ 50,000	$ 25,000*
TANGIBLE PLANT:					
Water Rights	105,000	$ 15,000	......	120,000	......
Reservoir Land	27,000	2,000	......	29,000	......
Power and Pumping Land	22,000	......	......	22,000	......
Purification Land	35,000	......	......	35,000	......
Transmission Land	21,500	500	......	22,000	......
Standpipe Land	3,000	......	......	3,000	......
Distribution Land	5,000	......	......	5,000	......
Office Land	4,000	......	......	4,000	......
Stores, Shop, & Garage Land	20,000	......	......	20,000	......
Collecting & Impounding Reservoirs	95,000	5,000	......	100,000	15,000
Wells & Springs	88,000	14,000	$ 2,000	100,000	30,000
Other Water Source Structures	84,000	2,000	1,000	85,000	8,500
Power & Pumping Structures	35,000	......	......	35,000	6,000
Purification Buildings	33,500	1,500	......	35,000	5,000
Distribution Standpipe	20,000	......	......	20,000	600
Office Buildings	10,000	......	......	10,000	2,000
Stores, Shop, & Garage Buildings	14,500	500	......	15,000	6,900
Boiler Plant Equipment	30,000	4,000	8,000	26,000	12,600
Steam Pumping Equipment	150,000	5,000	34,650	120,350	35,400
Electric Pumping Equipment	60,000	46,900	......	106,900	11,000
Purification System	140,000	20,000	......	160,000	12,000
Transmission Mains & Accessories	235,000	7,000	2,000	240,000	14,300
Distribution Mains & Accessories	295,600	48,975	13,650	330,925	93,093
Services	40,800	1,400	600	41,600	3,200
Meters	78,600	2,900	500	81,000	12,000
Hydrants	74,500	2,500	1,000	76,000	18,700
Fire Mains & Cisterns	19,900	100	1,000	19,000	3,600
Office Furniture & Equipment	42,300	1,600	75	43,825	22,207
Transportation Equipment	15,500	1,500	2,000	15,000	9,500
Stores Equipment	5,600	......	......	5,600	2,000
Shop Equipment	5,500	500	......	6,000	3,500
Laboratory Equipment	1,800	......	......	1,800	400
Communications Equipment	6,000	......	......	6,000	2,500
Miscellaneous Equipment	17,900	......	......	17,900	5,000
TOTALS (Figure 111)	$1,891,500	$182,875	$66,475	$2,007,900	$360,000

FIGURE 116
XYZ WATER WORKS
STATEMENT OF WORK IN PROGRESS AT CLOSE OF FISCAL YEAR

DESCRIPTION	Work Order Number	Work Completed	Estimated Complete Cost
Cherry Street 8″ Distribution Main	2420	$ 34,000	$ 73,000
Purification Building	2470	1,200	5,000
Garage Building	2480	3,600	4,500
Turkey Hill Well #80	2486	5,100	7,500
Transmission Main 42″	2490	26,100	150,000
TOTAL (Figure 111)		$70,000	$240,000

FIGURE 117
XYZ WATER WORKS
STATEMENT OF CASH RECEIPTS, DISBURSEMENTS, AND BALANCES FOR FISCAL YEAR

BALANCE OF GENERAL CASH (Beginning of Year)		$127,500
Receipts:		
Collection of Accounts Receivable	$466,000	
Collection of Accounts Receivable Previously Charged Off	126	
Customers' Deposits	700	
Contributions in Aid of Construction	3,065	
Interest	129	
Sale of Bonds	20,176	490,196
Disbursements:		$617,696
Construction	$ 47,789	
Payments on Account	276,057	
Interest	50,000	
Equipment	46,000	
Serial Bonds Retired	55,000	
Sinking Fund	11,000	
Refund of Customers' Deposits	650	486,496
BALANCE OF GENERAL CASH (End of Year) (Figure 111)		$131,200

FIGURE 118
XYZ WATER WORKS
ANALYSIS OF CHANGES IN SINKING FUND BALANCES FOR FISCAL YEAR

	First Mortgage Bonds	Debentures	Totals
BALANCE (Beginning of Year)	$167,000	$53,500	$220,500
Add—Contributions from Utility	15,000	5,000	20,000
Earnings on Investments	7,000	2,000	9,000
BALANCE (End of Year) (Figs. 111 & 119)	$189,000	$60,500	$249,500

FIGURE 119

XYZ WATER WORKS

STATEMENT OF BONDS OUTSTANDING AT CLOSE OF FISCAL YEAR

Description	Rate of Interest	Date of: Issue	Date of: Maturity	Bonds: Authorized	Bonds: Issued	Bonds: Outstanding	Sinking Fund: Required	Sinking Fund: Actual	Sinking Fund: Excess or Deficiency*
BONDS PAYABLE FROM SINKING FUND:									
First Mortgage.....	4%	1921	1940	$200,000	$200,000	$200,000	$188,500	$189,000	$ 500
Debentures........	4%	1926	1945	100,000	100,000	100,000	61,000	60,500	500 *
TOTAL BONDS PAYABLE FROM SINKING FUND				$300,000	$300,000	$300,000	$249,500	$249,500	
							(*Figures 111 and 118*)		
BONDS PAYABLE SERIALLY:									
Second Mortgage...	4%	1931	Various	$100,000	$100,000	$ 78,000			
Additions to Plant..	4½%	1936	$ 5,000 Annually	100,000	50,000	40,000			
Expansion.........	4%	1937	$50,000 Annually	750,000	750,000	650,000			
TOTAL BONDS PAYABLE SERIALLY				$950,000	$900,000	$768,000			
TOTAL BONDS				$1,250,000	$1,200,000	$1,068,000			
						(*Figure 111*)			

Figure 120

XYZ WATER WORKS

ANALYSIS OF CHANGES IN BONDS OUTSTANDING FOR FISCAL YEAR

Balance (Beginning of Year)	$1,103,000	
Bonds Issued (Details)	20,000	
Total		$1,123,000
Bonds Retired (Details)		55,000
Balance (End of Year) (Figure 111)		$1,068,000

Figure 121

XYZ WATER WORKS

ANALYSIS OF CHANGES IN EARNED SURPLUS FOR FISCAL YEAR

Earned Surplus (Beginning of Year)	$191,214
Credit Balance Transferred from Income Account (Figure 112)	41,500
Earned Surplus (End of Year) (Figure 111)	$232,714

Figure 122

XYZ WATER WORKS

DETAILED STATEMENT OF OPERATING REVENUES FOR FISCAL YEARS

	Current Year	Preceding Year	Increase or Decrease*
Sales of Water:			
Metered Sales to General Customers	$355,000	$332,000	$23,000
Flat Rate Sales to General Customers	50,000	45,000	5,000
Sales to Irrigation Customers	20,000	25,000	5,000*
Private Fire Protection	10,000	10,000	...
Public Fire Protection	40,000	45,000	5,000*
Other Sales to Public Authorities	10,000	9,000	1,000
Interdepartmental Sales	5,000	5,000	...
Sales to Other Water Utilities	20,000	20,000	...
Total Sales of Water	$510,000	$491,000	$19,000
Other Water Revenues:			
Rent from Water Property	$ 5,000	$ 4,500	$ 500
Interdepartmental Rents	6,000	6,000	...
Customers' Forfeited Discounts and Penalties	2,000	1,800	200
Servicing of Customers' Installations	5,000	4,200	800
Miscellaneous Water Revenues	2,000	2,000	...
Merchandising, Jobbing, and Contract Work	10,000	10,500	500*
Total Other Water Revenues	$ 30,000	$ 29,000	$ 1,000
TOTAL OPERATING REVENUES (Figure 112)	$540,000	$520,000	$20,000

FIGURE 123

XYZ WATER WORKS

DETAILED STATEMENT OF OPERATING EXPENSES FOR FISCAL YEARS

	Current Year	Preceding Year	Increase or Decrease *
SOURCE OF SUPPLY:			
Operation Supervision and Engineering	$ 9,600	$ 9,500	$ 100
Operation Labor	60,400	48,400	12,000
Operation Supplies and Expenses	3,000	3,200	200*
Maintenance Supervision and Engineering	2,300	2,200	100
Maintenance of Source of Supply Plant	25,000	24,500	500
Total Source of Supply	$100,300	$ 87,800	$12,500
POWER AND PUMPING:			
Operation Supervision and Engineering	$ 5,600	$ 5,500	$ 100
Operation Labor	46,200	45,200	1,000
Fuel for Power and Pumping	30,000	29,000	1,000
Supplies and Expense	5,000	5,100	100*
Maintenance Supervision and Engineering	500	400	100
Maintenance of Structures and Improvements	780	700	80
Maintenance of Power and Pumping Equipment	3,320	3,300	20
Total Power and Pumping	$ 91,400	$ 89,200	$ 2,200
PURIFICATION:			
Operation Supervision and Engineering	$ 7,000	$ 7,200	$ 200*
Purification Labor	30,000	29,500	500
Purification Supplies and Expense	16,000	15,800	200
Maintenance Supervision and Engineering	2,500	2,600	100*
Maintenance of Structures and Improvements	1,500	1,400	100
Maintenance of Purification Equipment	4,500	4,400	100
Total Purification	$ 61,500	$ 60,900	$ 600
TRANSMISSION AND DISTRIBUTION:			
Supervision and Engineering	$ 7,000	$ 6,900	$ 100
Departmental Office Expenses	2,200	2,000	200
Operation of Transmission and Distribution Lines	25,800	25,000	800
Operation of Meters	5,600	5,800	200*
Services on Customers' Premises	3,800	4,000	200*
Maintenance Supervision and Engineering	3,800	3,600	200
Maintenance of Structures and Improvements	500	450	50
Maintenance of Mains	15,000	14,850	150
Maintenance of Other Distribution Plant	4,000	3,900	100
Total Transmission and Distribution	$ 67,700	$ 66,500	$ 1,200
CUSTOMERS' ACCOUNTING AND COLLECTING:			
Supervision	$ 4,800	$ 4,600	$ 200
Customers' Contracts, Orders, Meter Reading and Collecting	18,500	18,000	500
Customers' Billing and Accounting	28,100	27,900	200
Miscellaneous Expenses	8,575	10,000	1,425*
Uncollectible Accounts	2,425	1,400	1,025
Total Customers' Accounting and Collecting	$ 62,400	$ 61,900	$ 500
ADMINISTRATIVE AND GENERAL:			
Salaries of General Officers and Executives	$ 7,100	$ 7,000	$ 100
Other General Office Salaries	8,000	7,900	100
Expenses of General Officers and General Office Employees	800	900	100*
General Office Supplies and Expenses	1,300	1,400	100*
Legal Services	2,000	2,500	500*
Insurance	10,000	10,000	....
Miscellaneous General Expenses	1,000	2,000	1,000*
Maintenance of General Property	1,500	2,000	500*
Total Administrative and General	$ 31,700	$ 33,700	$ 2,000*
TOTAL OPERATING EXPENSES (Figure 112)	$415,000	$400,000	$15,000

FIGURE 124

XYZ WATER WORKS

STATEMENT OF ESTIMATED OPERATING REVENUES COMPARED WITH ACTUAL FOR FISCAL YEAR

	Estimated	Actual	Excess of Actual over Estimated or Vice Versa*
SALES OF WATER:			
Metered Sales to General Customers	$347,000	$355,000	$ 8,000
Flat Rate Sales to General Customers	47,000	50,000	3,000
Sales to Irrigation Customers	26,000	20,000	6,000*
Private Fire Protection	9,000	10,000	1,000
Public Fire Protection	38,000	40,000	2,000
Other Sales to Public Authorities	9,500	10,000	500
Interdepartmental Sales	5,200	5,000	200*
Sales to Other Water Utilities	21,000	20,000	1,000*
TOTAL SALES OF WATER	$502,700	$510,000	$ 7,300
OTHER WATER REVENUES:			
Rent from Water Property	5,000	5,000	...
Interdepartmental Rents	6,000	6,000	...
Customers' Forfeited Discounts and Penalties	2,200	2,000	200*
Servicing of Customers' Installations	5,100	5,000	100*
Miscellaneous Water Revenues	1,700	2,000	300
Merchandising, Jobbing and Contract Work	27,300	10,000	17,300*
TOTAL OTHER WATER REVENUES	$ 47,300	$ 30,000	$17,300*
TOTAL OPERATING REVENUES (Figure 113)	$550,000	$540,000	$10,000*

FIGURE 125

XYZ WATER WORKS

STATEMENT OF ESTIMATED OPERATING EXPENSES COMPARED WITH ACTUAL FOR FISCAL YEAR

	Estimated	Actual	Excess of Estimated over Actual or Vice Versa*
SOURCE OF SUPPLY:			
Operation Supervision and Engineering	$ 9,800	$ 9,600	$ 200
Operation Labor	60,800	60,400	400
Operation Supplies and Expenses	2,900	3,000	100*
Maintenance Supervision and Engineering	2,400	2,300	100
Maintenance of Source of Supply Plant	25,500	25,000	500
Total Source of Supply	$101,400	$100,300	$1,100
POWER AND PUMPING:			
Operation Supervision and Engineering	$ 5,600	$ 5,600	....
Operation Labor	46,500	46,200	$ 300
Fuel for Power and Pumping	29,500	30,000	500*
Supplies and Expense	5,500	5,000	500
Maintenance Supervision and Engineering	500	500	....
Maintenance of Structures and Improvements	800	780	20
Maintenance of Power and Pumping Equipment	3,350	3,320	30
Total Power and Pumping	$ 91,750	$ 91,400	$ 350
PURIFICATION:			
Operation Supervision and Engineering	$ 7,100	$ 7,000	$ 100
Purification Labor	30,500	30,000	500
Purification Supplies and Expense	16,200	16,000	200
Maintenance Supervision and Engineering	2,600	2,500	100
Maintenance of Structures and Improvements	1,400	1,500	100*
Maintenance of Purification Equipment	4,600	4,500	100
Total Purification	$ 62,400	$ 61,500	$ 900
TRANSMISSION AND DISTRIBUTION:			
Supervision and Engineering	$ 7,200	$ 7,000	$ 200
Departmental Office Expenses	2,200	2,200	....
Operation of Transmission and Distribution Lines	25,900	25,800	100
Operation of Meters	5,800	5,600	200
Services on Customers' Premises	3,900	3,800	100
Maintenance Supervision and Engineering	3,850	3,800	50
Maintenance of Structures and Improvements	500	500	....
Maintenance of Mains	14,800	15,000	200*
Maintenance of Other Distribution Plant	4,200	4,000	200
Total Transmission and Distribution	$ 68,350	$ 67,700	$ 650
CUSTOMERS' ACCOUNTING AND COLLECTING:			
Supervision	$ 5,000	$ 4,800	$ 200
Customers' Contracts, Orders, Meter Reading and Collecting	19,000	18,500	500
Customers' Billing and Accounting	28,000	28,100	100*
Miscellaneous Expenses	8,700	8,575	125
Uncollectible Accounts	2,500	2,425	75
Total Customers' Accounting and Collecting	$ 63,200	$ 62,400	$ 800
ADMINISTRATIVE AND GENERAL:			
Salaries of General Officers and Executives	$ 7,200	$ 7,100	$ 100
Other General Office Salaries	8,400	8,000	400
Expenses of General Officers and General Office Employees	1,000	800	200
General Office Supplies and Expenses	1,500	1,300	200
Legal Services	2,000	2,000	....
Insurance	10,000	10,000	....
Miscellaneous General Expenses	1,200	1,000	200
Maintenance of General Property	1,400	1,500	100*
Total Administrative and General	$ 32,700	$ 31,700	$1,000
TOTAL OPERATING EXPENSES (Figure 113)	$419,800	$415,000	$4,800

FIGURE 126 *

XYZ WATER WORKS

COST OF PUMPING PER MILLION OF GALLONS FOR A PERIOD OF TEN FISCAL YEARS

Year	Million of Gallons Pumped	Total Cost	Cost Per Million Gallons
1929	3,318.01	$54,916.94	$16.55
1930	3,523.42	57,505.87	16.32
1931	3,386.63	49,471.81	14.61
1932	4,294.92	66,890.49	15.91
1933	4,864.59	67,435.74	13.86
1934	4,336.46	60,633.51	13.98
1935	4,091.94	50,138.05	12.25
1936	4,373.46	43,977.59	10.06
1937	3,504.95	44,563.20	12.71
1938	4,003.48	45,670.20	11.41

FIGURE 127 *

XYZ WATER WORKS

COST OF PURIFICATION PER MILLION OF GALLONS FOR A PERIOD OF TEN FISCAL YEARS

Year	Million of Gallons Purified	Total Cost	Cost Per Million Gallons
1929	4,091.52	$37,691.29	$ 9.21
1930	5,068.48	38,177.39	7.53
1931	4,986.11	44,181.42	8.86
1932	5,040.81	35,741.84	7.09
1933	4,722.96	36,696.37	7.77
1934	5,222.36	36,273.42	6.95
1935	4,525.58	35,208.51	7.78
1936	4,401.16	32,313.41	7.34
1937	3,304.90	33,685.92	10.19
1938	3,382.39	33,337.71	9.86

FIGURE 128 *

XYZ WATER WORKS

COST OF TRANSMISSION AND DISTRIBUTION PER MILLION OF GALLONS PUMPED FOR A PERIOD OF TEN FISCAL YEARS

Year	Million of Gallons Pumped	Cost of Transmission and Distribution	Cost Per Million Gallons Pumped
1929	50,500.21	$252,500	$5.00
1930	59,790.01	275,034	4.60
1931	64,142.20	264,906	4.13
1932	54,650.00	254,122	4.65
1933	51,178.11	195,988	3.83
1934	58,310.21	217,579	3.73
1935	56,760.04	207,174	3.65
1936	64,285.25	237,201	3.69
1937	66,100.11	245,992	3.72
1938	67,500.15	243,000	3.60

* It might also be advisable to show the population served and cost per capita.

FIGURE 129

XYZ WATER WORKS

COST PER FOOT OF MAIN LAID BY SIZE FOR A PERIOD OF TEN FISCAL YEARS

YEAR	SIZES 2″		4″		6″		8″		10″	
	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost
1929	700	$1.0136	16,150	$1.3484	20,208	$1.6117	26,259	$2.1001	3,673	$3.894
1930	3,405	.593	19,711	1.2061	60,514	1.4344	20,408	2.077	4,380	2.777
1931	.....	......	54,720	1.1623	54,677	1.3725	20,717	2.3972	.....	......
1932	2,920	.7351	22,529	1.1204	64,636	1.3605	15,934	2.216	.....	......
1933	2,380	.653	22,548	1.1733	54,859	1.446	22,711	2.2679	.....	......
1934	1,510	.6056	13,330	1.0669	43,573	1.333	34,151	1.9136	.....	......
1935	.....	......	12,910	1.0321	30,157	1.3478	4,518	1.9177	.....	......
1936	.....	......	5,812	.8940	27,017	1.2566	8,373	1.7249	.....	......
1937	480	.7533	......	....	11,258	1.5151	4,341	1.792	300	5.211
1938	502	.7044	1,461	1.0921	22,230	1.3694	12,690	1.9663	.....	......

Continued below.

Continued from above.

YEAR	12″		16″		20″		24″	
	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost	No. of Feet Laid	Unit Cost
1929	9,352	$2.8183	3,130	$5.655	......	....	......	....
1930	8,795	3.8461	......	....	5,008	$7.4418	......	....
1931	12,862	3.2586	......	....	......	....	2,147	$9.1633
1932	15,106	3.469	......	....	2,927	6.1191	......	....
1933	6,887	4.1015	......	....	......	....	......	....
1934	8,210	3.0973	......	....	......	....	7,434	9.7357
1935	5,358	2.6822	......	....	1,040	6.8763	......	....
1936	12,962	2.8357	1,930	3.4909	......	....	......	....
1937	3,781	3.3938	......	....	......	....	......	....
1938	4,926	3.4152	......	....	......	....	......	....

Note: A separate table should be prepared for each kind of pipe.

Figure 130

XYZ WATER WORKS

OPERATING REVENUES, OPERATING REVENUE DEDUCTIONS, NET OPERATING REVENUES, AND NET INCOME FOR A PERIOD OF TEN FISCAL YEARS

Year	Operating Revenues	Operating Revenue Deductions	Net Operating Revenues	Net Income
1929	$650,000	$549,000	$101,000	$150,000
1930	640,850	545,250	95,600	139,700
1931	585,220	521,720	63,500	98,650
1932	521,600	485,200	36,400	52,600
1933	482,375	475,160	7,215	15,415
1934	501,770	472,340	29,430	38,650
1935	494,150	465,900	28,250	41,900
1936	515,630	474,330	41,300	62,700
1937	531,980	477,420	54,560	81,260
1938	540,000	480,000	60,000	91,500

Figure 131

XYZ WATER WORKS

DEBT SERVICE CHARGES FOR A PERIOD OF TWENTY FISCAL YEARS

Year	Sinking Fund Maturities *	Sinking Fund Bond Requirements **	Serial Bond Maturities	Interest on Bonds	Total Bonds and Interest
1938	....	$275,500	$ 50,000	$310,000	$635,500
1939	....	270,000	70,000	302,900	642,900
1940	$2,000,000	268,900	85,000	298,300	652,200
1941	....	265,000	100,000	284,600	649,600
1942	....	264,300	110,500	278,500	653,300
1943	....	259,100	120,000	276,100	655,200
1944	....	258,000	140,300	274,000	672,300
1945	500,000	256,200	150,000	271,300	677,500
1946	....	248,100	175,000	267,900	691,000
1947	....	243,700	200,000	262,100	705,800
1948	....	238,600	210,500	258,200	707,300
1949	....	232,900	205,800	256,100	694,800
1950	500,000	230,700	200,300	249,900	680,900
1951	....	222,600	210,000	247,100	679,700
1952	....	220,200	212,600	243,800	676,600
1953	....	215,300	208,500	240,900	664,700
1954	....	190,100	215,000	241,800	646,900
1955	....	175,400	202,700	243,200	621,300
1956	....	170,800	200,100	244,400	615,300
1957	1,225,000	161,300	196,100	245,100	602,500

* Not included in "Total Bonds and Interest."

** "Sinking Fund Bond Requirements" refers to the amount by which the sinking fund must be increased annually to make possible the redemption of sinking fund bonds as they mature. The column is not needed if the utility has serial bonds only.

Chapter 20

BUDGETING

The Budget Defined

A budget is a plan of the expenditures to be incurred during a particular period and the means of financing them. In view of the great importance of budgeting for municipal plants, attention will be directed in this chapter primarily to budgeting for municipal utilities. However, the budgetary principles discussed here and practically all of the procedure illustrated can be readily adapted to the use of a private water utility.

Relationship of Municipal Utility to Other City Departments

It is assumed that the municipal water utility is subject to budgetary control by the municipality. As a matter of fact, the municipal water utility is frequently considered as not being particularly different from the other departments of the municipality in so far as budget control is concerned. In examining the budgetary procedure of a municipal utility, therefore, the relationship between the utility and the municipality must be recognized. The significance of this relationship will become more apparent later.

Agency Administering Budget

In larger cities, there usually exists a special budget agency in charge of a budget director. The duty of this agency is to collect all data relative to both revenues and expenditures necessary in budget preparation. The budget is presented by the chief executive, who takes into consideration all of the data presented by the budget director and also consults the latter regarding changes. The budget director's activity is usually advisory, however; and, as a matter of fact, both the budget director and the chief executive frequently consult with department heads, especially if a substantial change in the amount requested by the department head is contemplated.

In small municipalities, the preliminary work connected with

budget preparation is performed by the financial officer, after which the budget is reviewed by the chief executive, who may make any changes he sees fit before submitting the budget document to the legislative body of the municipality for adoption.

The above two cases represent the more common arrangement whereby the budget is submitted by the chief executive. Variations are, however, to be found, budget preparation in some cities being under the personal direction of a representative of the legislative body of the municipality. Throughout the present discussion, however, the assumption is that a situation similar to that illustrated in either of the first two cases exists.

Steps in Budgetary Procedure

Budgetary procedure may be classified into three parts. The first involves the preparation of estimates of revenues and expenditures by the departments and the submission of such estimates to the budget director, who later submits them to the chief executive. The second step is the consideration of the budget by the legislative body of the municipality and the adoption thereof by that body. The third is the exercise of budgetary control.

The Preparation of the Budget

The preparation of the budget usually starts about three months before the beginning of the fiscal year to which the budget applies. The first step in the preparation is a call by the budget director or chief executive for departmental estimates of revenues and expenditures.

Work Program and Expenditure Estimate Forms. Each division head prepares the expenditure estimate for his division. Two types of forms may be used in this connection. The first is a work program (Figure 132), which is a program of the amount of work to be done and the estimated cost of doing the work. In this connection, the statements illustrated in the chapter on cost accounting are helpful in that they indicate the amount of work done in the past and the cost per unit of work done. Not only should the work program show the amount of work for the year but also for each month during the year. A

FIGURE 132

XYZ WATER WORKS

DIVISION OF DISTRIBUTION

WORK PROGRAM

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 15, 1938* Submitted by *A. Johnson*

Operations	Standard Work Units	Total No. of Work Units for Year	Unit Cost Standard	Total Estimated Cost for Year	January		February	
					Work Units	Cost	Work Units	Cost
MAINTENANCE OF HYDRANTS:								
Flushing Hydrants	No. of	14,500	$.35	$5,075	1,200	$420	1,400	$490

general description of what is proposed to be done should be given for those activities which are not susceptible to unit cost measurement.

Each division head should prepare his estimate of expenditures on the basis of the work program. A form for recording such estimates for a division of water distribution is illustrated in Figure 133. These forms, together with work programs, are filed, upon completion, with the superintendent, who integrates the information shown on the various forms, makes any revisions which he deems necessary in the light of revenue estimates and other data after consultation with division heads, and submits the estimates for the department to the budget director.

Consideration and Adoption of the Budget

Upon receipt of the departmental estimates, the chief executive, with the aid of the budget director—if one exists—and after consultation with department heads, may make any revisions deemed necessary. The budget is then submitted for adoption to the legislative body, which may in turn make any revisions deemed necessary before finally adopting it.

The budget is adopted through the passage of an appropriation ordinance, the detail with which appropriations are made

FIGURE 133

XYZ WATER WORKS

DIVISION OF DISTRIBUTION

ESTIMATE OF OPERATING EXPENSES

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 15, 1938* Submitted by *A. Johnson*

Classification of Expenses	Amount Expended			Estimated Expenses	
	1936	1937	Jan. to Sept. 1938	Oct. to Dec. 1938	1939
Operation Supervision and Engineering	$15,300	$15,600	$12,275	$3,625	$16,100
Maintenance of Hydrants	29,000	30,000	23,025	7,675	31,600
TOTAL	$150,000	$153,000	$130,000	$25,000	$158,000

varying between different municipalities. It is generally agreed, however, that appropriations should be made in lump sums for each organization unit, subdivided by character of expenditure. Detailed appropriations, especially in the case of utilities, have a tendency to hamper management in carrying on its activities.

Statements to be Prepared

In order that the reader might visualize the budgetary process in its entirety, the complete procedure was briefly outlined above. Mention was made of the preparation of revenue and expenditure estimates, but since the contents of such estimates will vary with the relationship that exists between the utility and the city, they were not included as part of the description of the budgetary process which is more or less common to all municipalities. They are, however, discussed in detail below, two alternative situations being assumed and the statement to be prepared in each instance outlined. The desirable situation

is discussed first, followed by the outline of a situation which, though not desirable, is frequently found in practice.

Procedure Under Certain Assumptions. Before proceeding to state the assumption under which certain statements are recommended, it is desired to call attention again to the fact that utilities should be accounted for on an accrual basis. Assuming that the city operates either on an accrual or on a cash basis but that the utility's budget is not combined with the budget for the general fund and is set up on an accrual basis, the following statements would be desirable:

1. A statement showing actual revenues on an accrual basis (that is, billings) from each source during the last two years, the actual revenue for the current year to date, estimated revenue for the remainder of the current year, and estimated revenue for the budget year. (See Figure 134.)
2. A statement showing actual expenses for the last two years and the current year to date, estimated expenses for the remainder of the current year, and estimated expenses for the budget year. These expenses would be classified in the same manner as in an income statement. (See Figure 135.)
3. A statement showing expenditures for minor construction and the means of financing same. (See Figure 136.)
4. A statement showing expenditures for the purchase of capital assets and means of financing same. (See Figure 137.)
5. A statement showing proposed major construction and means of financing. (See Figure 138.)
6. A statement showing estimated debt service charges. (See Figure 139.)
7. A statement of proposed application of funds (that is, of receipts by sources and disbursements by purpose). (See Figure 140.)
8. A statement showing estimated receipts and disbursements by months. (See Figure 141.)

Procedure under Alternative Assumptions. Assuming that the municipality prepares its budget on a cash basis and that the utility is required to prepare its budget on a similar basis, the procedure will be somewhat different from that outlined immediately above. The utility's accounts should be kept on an

FIGURE 134

XYZ WATER WORKS

STATEMENT OF ESTIMATED REVENUES

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 10, 1938* Submitted by *C. Lewis*

REVENUE SOURCE	ACTUAL REVENUES			ESTIMATED REVENUES	
	1936	1937	Jan. to Sept. 1938	Oct. to Dec. 1938	1939
Metered Sales to General Customers	$347,000	$355,000	$270,000	$90,000	$368,000
Flat Rate Sales to General Customers	49,000	50,000	37,500	15,000	49,000
Sales to Irrigation Customers	19,500	20,000	16,500	5,500	24,000
Private Fire Protection	7,000	10,000	8,250	2,750	12,000
Public Fire Protection	41,000	46,000	28,500	9,500	27,000

FIGURE 135

XYZ WATER WORKS

STATEMENT OF ESTIMATED EXPENSES

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 25, 1938* Submitted by *C. Lewis*

ORGANIZATION UNIT AND CLASSIFICATION OF EXPENSES	ACTUAL EXPENSES			ESTIMATED EXPENSES	
	1936	1937	Jan. to Sept. 1938	Oct. to Dec. 1938	1939
DIVISION OF SOURCE OF SUPPLY:					
Operation Supervision and Engineering	$ 9,450	$ 9,600	$ 7,275	$ 2,425	$ 9,850
Operation Labor	57,600	60,400	46,500	15,500	64,000
Operation Supplies and Expenses	2,800	3,000	2,437	813	3,500
Maintenance Supervision and Engineering	2,170	2,300	1,950	650	2,900
Maintenance Source of Supply Plant	23,650	25,000	20,250	6,750	29,200

FIGURE 136

XYZ WATER WORKS

STATEMENT OF ESTIMATED EXPENDITURES FOR MINOR CONSTRUCTION AND MEANS OF FINANCING

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 15, 1938* Submitted by *C. Lewis*

Organization Unit and Classification of Expenditure	Estimated Cost	Means of Financing	Amount
DIVISION OF POWER AND PUMPING:			
Minor Addition to Power House	$2,000	Current Revenues	$2,000
Minor Addition to Pumping Station A	5,000	Current Revenues	5,000

FIGURE 137

XYZ WATER WORKS

STATEMENT OF PROPOSED PURCHASES OF CAPITAL ASSETS AND MEANS OF FINANCING

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 18, 1938* Submitted by *C. Lewis*

Purchasing Organization Unit	Name of Asset	No. of Units	Cost Per Unit	Total Cost	Means of Financing	Amount
Division of Power and Pumping	Boiler	1	$2,000	$2,000	Depreciation Fund	$1,500
					Current Revenues	500

FIGURE 138

XYZ WATER WORKS

SUMMARY STATEMENT OF PROPOSED MAJOR CONSTRUCTION AND MEANS OF FINANCING

FOR FISCAL YEARS ENDING DECEMBER 31, 1939 AND 1940

Date *October 16, 1938* Submitted by *B. Smith and C. Lewis*

Nature of Proposed Construction	Details in Schedule No.	Amount	Means of Financing	Amount
Annexed Suburb Extension	2	$200,000	Bonds	$150,000
			Contributions	30,000
			City's Share	20,000

FIGURE 139

XYZ WATER WORKS

STATEMENT OF ESTIMATED DEBT SERVICE CHARGES

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 15, 1938* Submitted by *C. Lewis*

Name of Issue	Amount to be Retired (Serial Bonds) or to be Contributed to Sinking Fund	Interest	Total Debt Service Charges
	Serial Bonds		
Addition to Plant	$10,000	$1,000	$11,000
Second Mortgage	15,000	1,500	16,500
TOTAL	$25,000	$2,500	$27,500
	Sinking Fund Bonds		
Annexed Suburb	$29,600	$2,400	$32,000

FIGURE 140

XYZ WATER WORKS

STATEMENT OF PROPOSED APPLICATION OF FUNDS

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

Date *October 25, 1938* Submitted by *C. Lewis*

FUNDS TO BE DERIVED FROM:		
Cash on Hand and in Bank	$ 86,900	
Collections on Account	453,700	
Notes Receivable	14,000	
Interest	7,800	
Miscellaneous Receipts	11,500	
Loans	2,500	
TOTAL		$576,400
FUNDS TO BE DISBURSED FOR:		
Payment on Account	$ 39,200	
Payroll	273,100	
Taxes	2,800	
Interest	9,200	
Notes Payable	13,700	
Bond Requirements	54,600	
New Equipment	9,500	
Plant Extension	20,500	
TOTAL		422,600
ESTIMATED CASH BALANCE		$153,800

FIGURE 141

XYZ WATER WORKS

STATEMENT OF ESTIMATED RECEIPTS AND DISBURSEMENTS AND BALANCES BY MONTHS

FOR FISCAL YEAR ENDING DECEMBER 31, 1939

SOURCE AND PURPOSE	JAN.	FEB.	MAR.		DEC.	TOTAL
BALANCE	$20,000	$17,100	$26,050		$87,700	$20,000
Receipts:						
Collections on Account	$35,000	$37,000	$36,000		$38,000	$453,700
Notes Receivable	2,000	1,000	700		1,000	14,000
Interest	1,000	200	300		1,000	7,800
Miscellaneous Receipts	800	1,000	700		1,600	11,500
Loans	......	......	......		1,200	2,500
Total Receipts	$38,800	$39,200	$37,700		$42,800	$489,500
TOTAL RECEIPTS AND BALANCES	$58,800	$56,300	$63,750		$130,500	$509,500
Disbursements:						
Payment on Account	$ 5,000	$ 4,000	$ 5,000		$ 4,000	$ 39,200
Payroll	21,000	22,000	23,000		20,000	273,100
Taxes	1,000	......	1,000		400	2,800
Interest	1,700	200	800		1,200	9,200
Notes Payable	500	1,000	1,500		500	13,700
Bond Requirements	10,000	......	......		14,000	54,600
New Equipment	1,000	1,500	1,000		1,000	9,500
Plant Extension	1,500	1,550	1,800		2,500	20,500
Total Disbursements	$41,700	$30,250	$34,100		$43,600	$422,600
BALANCE	$17,100	$26,050	$29,650		$86,900	$86,900

accrual basis, but it will be necessary, in addition, to report the data on a cash basis. The statements illustrated in Figures 134 to 138 would also be applicable in this case except that the data would relate to cash transactions. For example, the statement illustrated in Figure 134 would show revenue receipts instead of revenue billed. Figures 139, 140, and 141 could be used in this instance without any change. In addition, it would be advisable to prepare a statement showing at least estimated operating revenues and expenses on an accrual basis.

Under the last assumption, it may be necessary to classify operating expenses by object—that is, as to whether they have been made for salaries and wages, contractual services, materials and supplies, and fixed charges—in which case the classification of accounts outlined in this manual is applicable. Some of the accounts, however, would have to be further subdivided to provide the classification by object. Thus, assuming the object classification is used, it would be necessary to subdivide each of the expense accounts listed on pages 32–35 in order to show which part of the expenditure represented by the account was for salaries and wages, which for contractual services, etc. For example, the account Maintenance of Structures and Improvements (726) listed under *Power and Pumping Expenses* on page 33, should be further subdivided somewhat as follows:

726. Maintenance of Structures and Improvements
    726.1. Salaries and Wages
    726.2. Contractual Services
    726.3. Materials and Supplies

In most instances, however, the accounts need not be broken down any further since the account in itself indicates the object of expenditure. For example, the account Operation Labor (702), listed under *Source of Supply Expenses* on page 32, indicates in itself that salaries and wages are involved; and the account Fuel for Power and Pumping (723), listed under *Power and Pumping Expenses* on page 33, indicates that the expense is for materials and supplies.

Preparation of Allotment Schedules

An allotment is a division of an annual appropriation by quarterly or monthly periods to show the proposed rate of ex-

penditure during the year. The reason for allotting appropriations is that the volume of activities, and therefore of expenditures, is not uniform throughout the year. Appropriations usually authorize merely the total amount to be spent during the year; they do not indicate the rate of expenditure. Assuming that an allotment system is in use, the first step after the adoption of the budget is the preparation of allotment schedules.

The allocation of allotments is an executive function and is usually delegated to the chief executive. He, however, usually takes into account the requests made by division heads. Allotments should be prepared by the head of each division of the utility and submitted to the superintendent, who, after approving same, should transmit them to the chief executive. Allotments should be based on work programs, which should accompany the allotment estimates when the latter are submitted to the superintendent and to the chief executive. After approval of allotments by the chief executive, division heads are required to stay within the amount allotted for each activity unless the chief executive permits otherwise.

Budgetary Control

A budget is a plan and, like all plans, it is valuable only to the extent that it is carried out. Provision must, therefore, be made in the accounting system for controlling expenditures in such manner that the amount budgeted, or allotted, for an organization unit is not overexpended. This is accomplished in each expenditure account by providing for entering the amount budgeted, the amount expended, and the unexpended balance. Provision should also be made for contingent liabilities in the form of purchase orders and contracts, commonly known as encumbrances, which reduce the amount budgeted.

A form for an expenditure account, showing the amount budgeted, expenditures, encumbrances, and the unencumbered balance, is illustrated in Figure 142. The amount budgeted is entered in Column 11; and as commitments arise, they are entered in Columns 5 and 6, and the balance in Column 11 is reduced by the amount of the encumbrance. After the goods are received or the service performed, the amount to be paid, that is, the amount vouchered, is entered in Columns 8 and 9.

FIGURE 142

CUMULATIVE ALLOTMENTS

Jan.	$ 500	July	2,750
Feb.	1,000	Aug.	3,000
Mar.	1,500	Sept.	3,500
Apr.	1,750	Oct.	4,000
May	2,000	Nov.	4,500
June	2,500	Dec.	5,000

ACCOUNT NO.______

DIVISION______

XYZ WATER WORKS

EXPENDITURE ACCOUNT

Date	Description	Encumbrances				Expenditures				Unen-cumbered Balance
		Order No.	Paid or Canceled	Issued	Balance	Voucher No.	Amount	Total Ex-penditures	Budget Estimate	
1	2	3	4	5	6	7	8	9	10	11
1/1/39	....	....	......	......	......	..	......	......	5,000.00	5,000.00
1/2/39	Stationery and Printing	2	......	405.00	405.00	..	......	......	....	4,595.00
1/6/39	Pencils, Pens, etc.	4	......	50.00	455.00	..	......	......	....	4,545.00
1/21/39	Stationery and Printing	....	405.00	......	50.00	37	400.00	400.00	....	4,550.00

Encumbrances represent estimates of contingent liabilities. Since, however, the actual liability has now been determined, the encumbrance is canceled by entering the amount thereof in Column 4. In view of the fact that the amount actually expended may be greater or smaller than the encumbrance, it is necessary to adjust the balance in Column 11 by the difference between the amount of the encumbrance and the amount of the actual expenditure.

Under this procedure the budgetary and proprietary accounts are combined in one account. The only separate budgetary accounts needed are controlling accounts for total estimated revenues, for total encumbrances, and for total appropriations. An alternative procedure is to provide, also, for separate subsidiary budgetary and proprietary accounts, but this is not recommended since it requires a duplication of work. For a more detailed discussion of this particular phase of the subject, the reader is referred to *Municipal Accounting Statements,* published by the National Committee on Municipal Accounting.

Rules are usually set up prohibiting the placing of any orders or the entering into any contracts without certification from a financial officer that a sufficient amount is available to the credit of the division requesting to make the expenditure. As the finance officer makes the certification, he reduces the amount of the unexpended balance by the estimated liability incurred on account of the order or contract. A form suitable for this purpose is illustrated in Figure 143.

Whichever procedure is followed, that procedure must make possible the preparation of monthly statements showing whether or not the division has stayed within the amount budgeted. A form for such a statement is illustrated in Figure 145. It is also important to know whether or not revenues are accruing as anticipated. For this purpose Figure 144 is an illustration of a suitable form.

FIGURE 143

XYZ WATER WORKS

Request for Certification of Contract or Agreement

Contract or Agreement No.______________

Reference No.______________

Dept. Req. No.______________

Department.......................................Date..............................

TO THE CITY AUDITOR:

Kindly certify that the cost of the work or supplies as shown below is fully covered by unencumbered balance in the fund or funds as shown.

....

Material, Supplies or Services	Amount

FUND	

Liquidations								For Certification Stamp
Date	Voucher No.	Amount	Total to Date	Date	Voucher No.	Amount	Total to Date	

FIGURE 144

XYZ WATER WORKS

STATEMENT OF ACTUAL REVENUES COMPARED WITH ESTIMATES

FOR CURRENT MONTH AND TO DATE

Sources of Revenue	Total Estimated for Year	This Month			Total to Date			Balance Due
		Estimated	Actual	Over or Under* Estimate	Estimated	Actual	Over or Under* Estimate	
Metered Sales to General Customers	$383,000	$32,000	$30,500	$1,500*	$195,000	$194,500	$ 500*	$188,500
Flat Rate Sales to General Customers	55,000	4,000	3,850	150*	29,000	28,700	300*	26,300
Sales to Irrigation Customers	26,000	2,500	2,600	100	15,000	13,800	1,200*	12,200
Merchandising, Jobbing, and Contract Work	12,000	1,100	1,300	200	7,000	7,200	200	4,800
TOTAL	$610,000	$49,000	$47,500	$1,500*	$320,000	$312,500	$7,500*	$297,500

FIGURE 145

XYZ WATER WORKS

STATEMENT OF ACTUAL EXPENSES COMPARED WITH ESTIMATES

FOR CURRENT MONTH AND TO DATE

Organization Unit and Classification	Total Estimated for Year	This Month			Total to Date			Unexpended Balance	Unencumbered Balance
		Estimated	Actual	Excess of Estimated over Actual, or Vice Versa*	Estimated	Actual	Excess of Estimated over Actual, or Vice Versa*		
DIVISION OF SOURCE OF SUPPLY									
Source of Supply:									
Operation Supervision and Engineering	$ 10,000	$ 1,000	$ 980	$ 20	$ 9,000	$ 8,750	$ 250	$ 1,250	$ 1,250
Operation Labor	62,000	5,000	5,200	200*	58,000	59,100	1,100*	2,900	2,900
Operation Supply and Expense	4,000	300	250	50	3,700	3,650	50	350	300
Maintenance Supervision and Engineering	2,800	200	175	25	2,650	2,575	75	225	200
Maintenance Source of Supply Plant	26,500	2,500	2,200	300	24,000	23,100	900	3,400	3,400
Total Source of Supply	$105,300	$ 9,000	$ 8,805	$ 195	$ 97,350	$ 97,175	$ 175	$ 8,125	$ 8,050
Power and Pumping:									
Operation Supervision and Engineering	$ 5,000	$ 400	$ 375	$ 25	$ 4,800	$ 4,750	$ 50	$ 250	$ 250
TOTAL EXPENSES	$420,000	$39,000	$37,850	$1,150	$387,500	$382,200	$5,300	$37,800	$37,500

Appendix 1

TERMINOLOGY[1]

Abatement. See *Allowance.*

Accounting Period. A period at the end of which and for which financial statements are to be prepared. See also *Fiscal Period.*

Accounting Procedure. Methods used in handling accounting information so that it will be reflected in the accounting records in an orderly manner.

Accounting System. All the records, formal and informal, together with the procedures which have to do with assembling, recording, and reporting of information concerning the financial operations and condition of an enterprise.

Account Number. The number assigned to a specific account title in a classification of accounts.

Note: Where accounts are so numbered, the account number and the account title may be used interchangeably. Each number should have the same meaning wherever used and should be selected with great care so that it will indicate immediately and with certainty the title of the account as well as its place in the classification.

Accounts Payable. Liabilities on open account.

Accounts Receivable. Amounts owed to the water utility on open account.

See also *Customers' Accounts Receivable, Due from Municipality,* and *Special Accounts Receivable.*

Accrual Basis. When revenues are accounted for when earned or due, even though not collected, and expenditures are accounted for as soon as liabilities are incurred, whether paid or not, the system of accounting is said to be on the accrual basis. (N.C.M.A.)

Accrued Expenses. Expenses which have been incurred up to a given date, but have not been paid and, in some cases, are not payable until a future date. (N.C.M.A.)

Accrued Income. Income which has been earned up to or is due at a given date, but has not been collected. (N.C.M.A.)

Advances for Construction. A liability for money received to finance extension of water facilities.

Note: Such extensions are frequently financed at least partly from funds advanced by customers, or prospective customers. Usually there is an agreement providing for the return of the money to the cus-

[1] The letters "N.C.M.A." in parentheses following a definition indicate that the definition is taken from the terminology of the National Committee on Municipal Accounting as given on pages 133–56 of its publication *Municipal Accounting Statements.* In a few cases such definitions have been modified slightly to make them applicable to utility accounting. The letters "q.v." in parentheses signify "which see."

tomers if revenues become sufficient to have justified making the extensions.

See also *Contributions in Aid of Construction*.

Allowance. The cancellation, in whole or in part, of an account receivable.

Amortization. (1) Gradual reduction, redemption, or liquidation of the balance of an account according to a specified schedule of times and amounts. (2) Provision for the extinguishment of a debt by means of a sinking fund (q.v.). (N.C.M.A.)

Appraisal. (1) The act of estimating the value of property. (2) The value of property as estimated by a property valuation expert.

Appropriation. An authorization by the legislative body to make expenditures and incur liabilities for specific purposes.

Note: An appropriation is usually limited in amount and as to the time when it may be expended. (N.C.M.A.)

Appropriated Surplus. That part of surplus (q.v.) which has been set aside for some specific purpose.

Arrears. That part of a customer's account which is past due.

Assets. Any property which is of value to, and owned by the enterprise.

Audit. In the absence of any expression defining the extent to which it has been limited, an audit is understood to be an examination of the subject matter of the accounting in all its financial aspects, including, so far as the several classifications of accounts may be involved, the verification of assets, liabilities, receipts, disbursements, revenues, expenditures, reserves, and surplus, and their application, in such detail as may be necessary in the circumstances for each individual case, to permit certification of the statements rendered and of the accountability of the fiduciary parties. (N.C.M.A.)

Auditor's Certificate. A statement signed by the auditor stating that he has examined the accounting records and purporting to express his opinion, based on such examination, regarding the financial condition of the enterprise, the results from operations, and any facts which the auditor in his professional capacity has investigated. (N.C.M.A.)

Note: The certificate should define the scope of the audit.

See *Qualified Certificate* and *Unqualified Certificate*.

Auditor's Qualified Certificate. See *Qualified Certificate*.

Auditor's Unqualified Certificate. See *Unqualified Certificate*.

Bad Debts. See *Uncollectible Accounts*.

Balance Sheet. A statement showing the financial position of an enterprise at a specified date, ordinarily prepared from books kept by double entry. (N.C.M.A.)

Balance Sheet Equation. An algebraically stated relationship between the basic groups of the balance sheet expressed in the form: Assets = Liabilities + Net Worth; or, Assets − Liabilities = Net Worth.

Bond. A written promise to pay a specified sum of money, called the face value, at a fixed time in the future, called the date of maturity, and carrying interest

at a fixed rate, payable periodically.

NOTE: The difference between a note and a bond is that the latter usually runs for a longer period of time and requires greater formality. (N.C.M.A.)

Bond Discount. The excess of the face value of a bond over the price for which it is acquired or sold. (N.C.M.A.)

Bond Premium. The excess of the price at which a bond is acquired or sold, over its face value. (N.C.M.A.)

Bonded Debt. That portion of the indebtedness of an enterprise represented by outstanding bonds. Preferred to *Funded Debt.* (N.C.M.A.)

Bonded Indebtedness. See *Bonded Debt.*

Books of Original Entry. Those books in which the various transactions are formally recorded for the first time, such as the Voucher Register, Journal, Cash Book, or Check Register.

Where machine bookkeeping is used, it may happen that one transaction is recorded simultaneously in several records, any one of which may be regarded as the book of original entry.

Memorandum books, check stubs, files of duplicate sales invoices, etc., whereon first or prior business notations may have already been made, are not books of first (original) entry in the accepted meaning of the term, unless they are also used as the mediums for direct posting to the ledgers. (N.C.M.A.)

Book Value. Value, as shown by books, regardless of whether such value is understated or overstated.

Budget. An estimate of proposed expenditures for a given period or purpose and the means of financing them. (N.C.M.A.)

Buildings. See *Structures.*

Callable Bonds. A type of bond (q.v.) which permits the payment of the obligation before the stated maturity date by giving notice of redemption in a manner specified in the bond contract. Synonym: *Optional Bonds.* (N.C.M.A.)

Capital Assets. See *Fixed Assets.*

Capital Expenditures. Expenditures which result in the acquisition of or additions to fixed assets. (N.C.M.A.)

Capital Outlay. See *Capital Expenditures.*

Capital Stock. That part of the net worth (q.v.) which in private corporations is evidenced by the total of shares outstanding of either a stated or par value. The term also refers to the individual shares of stock.

Capital Surplus. That part of net worth (q.v.) which is represented by neither capital stock (q.v.) nor earned surplus (q.v.). It arises from recapitalization, revaluation of assets, premiums on shares of stock sold, and donations to the enterprise.

Cash. Money, including currency and other forms of exchange, on hand, on deposit in a bank, or with an official or agent designated as custodian of cash.

NOTE: Any restrictions or limitations as to the availability of cash should be indicated. (N.C.M.A.)

Cash Basis. When revenues are accounted for when received in cash, and expenditures are accounted for when paid, the system of accounting is said to be

on the cash basis. (N.C.M.A.)

Cash Discount. An allowance made on an account if paid within a stated period.

NOTE: This term is not to be confused with trade discount (q.v.). (N.C.M.A.)

Cash Dividend. A dividend paid in cash as distinguished from a stock dividend or a dividend paid in property.

See *Dividend, Property Dividend,* and *Stock Dividend.*

Cash on Hand. All cash, except that held as change funds (q.v.) and petty cash (q.v.), collected but not as yet deposited.

Certified Public Accountant. An accountant to whom a state has given a certificate showing that he has met its requirements and is permitted to use the designation, "C.P.A." (N.C.M.A.)

Change Funds. Money on hand not to be deposited but to be used in making change, so that collections may be deposited intact in the proper depository.

Character. As applied to an expenditure classification, this term refers to the relationship of expenditures to current, prior, and future fiscal periods, i.e., whether the expenditure is an expense, provision for the retirement of debt, or a capital outlay. (N.C.M.A.)

Chartered Accountant. A member of an Institute of Chartered Accountants in the British Empire. Admission to such institutes is dependent upon serving a period of apprenticeship and passing an entrance examination.

City Equity. The net contributions in cash, property, or services to the municipal utility by the city in which it operates from the date when the first expenditures in connection with the municipal utility were incurred to the date of the balance sheet.

Classification of Accounts. A list of accounts arranged in groups, each group referring to some particular phase of accounting information relative to the financial operations of the enterprise and its financial condition.

See also *Account Number.*

Clearing Account. An account used to accumulate total charges or credits for later distribution among the accounts to which such charges or credits are properly allocable.

Codification. Numbering, or otherwise designating, accounts, entries, invoices, vouchers, etc., in such a manner that the symbol used reveals certain essentials. For example, the symbolization of accounts; numbering monthly recurring journal entries so that the numbers indicate the month and the nature of the entry; numbering invoices or vouchers so that the number reveals the date of entry. (N.C.M.A.)

See also *Account Number.*

Commitments. 1. Agreements to purchase specified materials or services in the future from particular parties or their agents. See also *Encumbrances.*

2. Agreements to sell specified materials or services in the future to particular parties or their agents.

Composite Rate of Depreciation. A single depreciation rate to be applied against the total depreciable assets, or groups of assets, in order to determine the depreciation for an accounting period.

Its use assumes that the depreciation expense thus arrived at is the same as would be obtained by applying proper individual rates of depreciation against the cost of each unit, and adding the individual amounts.

Construction. See *Work in Progress.*

Consumers' Accounting and Collecting. See *Customer Accounting and Collecting*, which is preferred.

Contingent Assets. Assets which are not owned by the enterprise at present but which will be owned at a later date if a certain prescribed set of circumstances comes to pass, or if certain acts are performed.

Contingent Liabilities. Items which may become liabilities as a result of conditions undetermined at a given date, such as guarantees, pending law suits, judgments under appeal, unsettled disputed claims, unfilled orders, and uncompleted contracts.

NOTE: All contingent liabilities should be shown on the face of the balance sheet, or in a footnote thereto. (N.C.M.A.)

Contributions in Aid of Construction. Cash or other assets contributed or donated to the utility for the purpose of financing wholly or in part extensions of water facilities.

See also *Advances for Construction.*

Controlling Account. An account, usually kept in the General Ledger, which receives the aggregate of the debit and of the credit postings to a number of identical, similar or related accounts called subsidiary accounts, so that its balance equals the aggregate of the balances in these accounts.

NOTE: It serves as a check upon the mathematical accuracy of the detail ledger account postings and frees the control ledger of a mass of detail. (N.C.M.A.)

See also *General Ledger* and *Subsidiary Accounts.*

Cost. The total expenditure involved in accomplishing a specific purpose, carrying on a specific activity, completing a unit of work or specific job, or acquiring specific assets.

Cost Accounting. That method of accounting which provides for the assembling and recording of all the elements of cost incurred to accomplish a purpose, to carry on an activity or operation, or to complete a unit of work or a specific job.

Cost of Replacement. See *Replacement Cost.*

Cost of Reproduction. See *Reproduction Cost.*

Cost Unit. Quantity, or amount, which is selected as a measure by means of which the cost of a given piece of work may be compared with a standard cost (q.v.) or with the cost of similar work. (N.C.M.A.)

Current Assets. Assets available for general operating purposes which are either in the form of cash, or which in the routine of operation will be converted into cash within a period usually no longer than one year from the date of the balance sheet, and other assets which may readily be converted into cash.

Current Liabilities. Those liabilities which must be paid within a period no longer than one year from the date of the balance sheet.

Customer Accounting and Collecting. That phase of the utility's activity relating to the determination of the amount due from each customer, the billing therefor, collecting of amounts due, together with various procedures necessary to record in detail the transactions relating to the above activities.

Customers' Accounts Receivable. Accounts receivable (q.v.) arising primarily as a result of supplying water to customers.

Customers' Deposits. The liability of the water utility for money deposited with it by customers as at least a partial guarantee that they will meet their bills.

Customers' Forfeited Discounts. Amounts which the utility allows its customers on condition that they pay their water bills on or before a specified date and which are forfeited by the customers because of failure to pay within the specified time.

Cycle System. A prearranged plan whereby the various operations of the customer accounting department, such as meter reading, billing, collecting, posting, etc., are staggered over a definite period in order to distribute the work of the department evenly.

Debt Service. The amount of money necessary annually to pay the interest on the outstanding debt, and the principal of maturing bonded debt not payable from a sinking fund (q.v.) and to provide a fund for the redemption of bonds payable from a sinking fund. (N.C.M.A.)

Deferred Assets. See *Deferred Charges.*

Deferred Charges. Expenditures which are not chargeable to the period in which made, but are carried on the asset side of the balance sheet, pending amortization or other disposition. They include such items as discount on bonds issued.

NOTE: Deferred charges usually involve expenses which are to be spread over a relatively long period of time and which do not recur regularly in the operation of the enterprise. They are thus to be distinguished from other prepaid expenses which are usually to be spread over a short period of time and which recur more or less regularly in the operation of the enterprise.

See also *Prepaid Expenses.*

Deferred Credits. Credit balances or items which will be spread over following accounting periods either as an addition to income, or as a reduction of certain expenses. Payments made in advance represent an example of the latter.

Deferred Debits. See *Deferred Charges.*

Deferred Expenses. See *Prepaid Expenses.*

Deferred Income. See *Deferred Credits.*

Deferred Liabilities. Liabilities not elsewhere provided for which are not current in nature and on which payment or other disposition is deferred to a future accounting period. An example is customers' advances for construction.

Deficit. The amount by which liabilities, reserves, and capital stock of a private water utility (q.v.) exceed its assets. In the case of municipal utilities, it is the amount by which the liabilities, reserves, and city equity exceed the assets.

See also *Surplus.*

Depreciation. Loss in service value of assets, other than wasting assets,

due to wear and tear, and obsolescence.

Depreciation Method. The method used in apportioning depreciation over accounting periods.

Direct Labor. Labor directly expended or applied in productive operations as distinguished from labor not directly connected with a productive process.

Direct Materials. Materials which can be identified with a particular product or service and the cost thereof charged directly to it.

Discounts. Actual or contingent reductions in the price of services or materials which are first stated at some other and larger amount. See also *Cash Discount* and *Trade Discount*.

Distribution. See *Water Distribution*.

Dividend. A pro-rata distribution to the stockholders of a corporation.

Note: Dividends may operate to reduce surplus or capital. They may be paid in the form of cash or other assets, or in stock, scrip, or other obligations.

See *Cash Dividend, Property Dividend,* and *Stock Dividend*.

Dividend Declarations. The authorization by the board of directors of the payment of a dividend.

Double Entry. A system of bookkeeping based on the fundamental theory that every business transaction has a two-fold aspect and, therefore, a complete record is obtained by entering equal amounts to the debit of one or more accounts and to the credit of another account or accounts. (N.C.M.A.)

Due from Municipality. Accounts receivable from the municipality in which the water utility operates. Where bills are regularly rendered and regularly paid the account should be treated as a part of Customers' Accounts Receivable (q.v.).

Earned Surplus. That part of surplus (q.v.) which has arisen out of earnings. The term is not limited to free surplus (q.v.) and may include also appropriated surplus (q.v.).

Encumbrances. Obligations in the form of purchase orders or contracts which reduce the balance of the particular budget account to which they are chargeable. They cease to be encumbrances when paid or converted into an actual liability.

Note: The use of the term here should be distinguished from its use to signify a lien, or mortgage, which may encumber property.

See also *Commitments*.

Exhibits. The accounts, statements, and other papers that accompany and are a part of a financial report. Sometimes the term is used only for the balance sheet or other principal statements. (N.C.M.A.) See also *Schedules*.

Expenditures. Amounts paid or incurred for all purposes, including expenses, provision for retirement of debt, and capital outlays. Synonymous with *Outlay*.

Note: If the accounts are kept on the cash basis (q.v.) the term covers only actual disbursements. If the accounts are kept on the accrual basis (q.v.) the term also includes charges incurred but not paid. (N.C.M.A.)

Expenses. Expenditures for operation, maintenance, interest, and other current purposes.

Fiscal Period. Any period at the end of which an enterprise closes its books in order to determine its

financial condition and the results of its operations.

NOTE: It is usually a year, though not necessarily a calendar year. (N.C.M.A.)

Fixed Assets. Assets of a more or less permanent character or intended for long time use which are employed in the operation of the utility. Fixed assets may be either tangible (q.v.) or intangible (q.v.).

Fixed Capital. See *Fixed Assets.*

Fixed Liabilities. Liabilities which are to be paid one year or more after the date of the balance sheet.

See also *Bonded Debt.*

Franchises. Privileges that permit usually for a stipulated period the continuing use of public property, such as city streets, and usually involve the element of regulation. (N.C.M.A.)

Free Surplus. That portion of surplus (q.v.) which has not been appropriated for any particular purpose.

NOTE: Ordinarily the term refers to some part of earned surplus (q.v.).

See also *Appropriated Surplus.*

General Expenses. A class of expense accounts grouped together for the purposes of the Income Statement (q.v.). They represent expenses incurred in the operation of the enterprise which are not otherwise classified and which are not directly connected with productive operations. These expenses are also sometimes referred to as General and Administrative Expenses. Examples are salaries of general officers and executives and general office expenses.

General Journal. A book of original entry (q.v.) in which are made all entries not recordable in special journals.

General Ledger. An accounting record containing accounts in which are recorded in detail or in summary all the transactions of the enterprise.

NOTE: In double-entry (q.v.) bookkeeping the debits equal the credits and therefore, the debt balances equal the credit balances. (N.C.M.A.)

See also *Controlling Account, Subsidiary Accounts,* and *Subsidiary Ledger.*

Gross Revenue. See *Revenue.*

Group Plan. A plan used in accounting for depreciation whereby a composite rate (q.v.) of depreciation is applied in connection with a group of assets involved in some operating phase of the enterprise.

Improvements. Buildings and structures and other appurtenances such as intakes, suction pipes, and distribution mains.

Inadequacy. The inability of plant and equipment to carry the productive load essential to rendering efficient and economical service.

Income Statement. A statement setting forth the revenues earned, the expense incurred, and the excess of deficiency of revenue compared with expense, in the operation of the enterprise or incidental thereto. (N.C.M.A.)

Income and Expense Statement. See *Income Statement.*

Indirect Charges. See *Overhead.*

Indirect Labor. Labor which can not be identified with the specific furtherance of any construction, operation, or productive process, but which, nevertheless, does further general operations.

Intangible Fixed Assets. Non-physical fixed assets (q.v.), such as patents and franchises.

Internal Check. An accounting method or procedure so designed that the work of one employee is complementary to that of another, thus providing a continuous audit by the employees on the accuracy of their accounting work. (N.C.M.A.)

Inventory. A detailed list showing quantities, descriptions, and values of property. It may also include units of measure and unit prices.

NOTE: The term is often confined to consumable materials, but may also cover fixed assets. (N.C.M.A.)

Investments. Securities, or other property, exclusive of the utility's operating property, in which money is invested either temporarily or for long periods.

Investments in Default. Bonds, notes, mortgages, or other negotiable or non-negotiable instruments on which there exists a default in the payment of principal or interest. (N.C.M.A.)

Job Account. An account pertaining either to an operation which occurs regularly (a "standing job"), or to a specific piece of work (a "job order"), showing all charges for material and labor used, and expenses incurred, together with any allowances or other amounts which may be credited. (N.C. M.A.)

Journal. Any book of original entry (q.v.) in which a record is first made and in which explicit or implied directions are given for posting to specific accounts the financial information involved in a transaction or group of transactions.

Journal Voucher. A voucher provided for the recording of certain transactions or information in place of or supplementary to the journals or registers. (N.C.M.A.)

Land. Land owned, which is used or useful, and rights to use land not owned. Included under this term are land-sites, rights of way, easements, and leaseholds.

Leaseholds. Rights to the use of land for which a consideration has been paid, as distinguished from the ownership in the land.

Ledger. Any medium for collecting financial information under separate account titles.

Liabilities. Debts or other legal obligations arising out of transactions in the past, which must be liquidated or renewed or refunded upon some future date.

NOTE: The term should be confined to items payable, but not necessarily due. (N.C.M.A.)

Liability Reserves. Liabilities the amount of which represents merely an estimate because of lack of invoices or other sources of information from which to determine the exact amount of the liability.

NOTE: The difference between a liability reserve and a contingent liability (q.v.) is that the former represents a definite liability the approximate, though not the exact, amount of which is known, whereas the latter consists of items which may become liabilities as a result of conditions undetermined at the balance sheet date.

Maintenance. The upkeep necessary for efficient operation of physical properties.

Matured Interest. Interest due but unpaid.

Merchandise for Resale. Goods to be

sold substantially in the form in which purchased.

Meter Reading. Securing and recording information with reference to the consumption of water by each customer. The term may include other activities of the meter reader such as testing meters and investigating high consumption.

Meter Routes. The route to be covered by a meter reader.

NOTE: Usually the meter reading sheets for each route are bound in individual loose-leaf binders and planned for complete coverage in one working day.

Municipal Water Utility. A water utility (q.v.) owned by a local governmental unit or units.

See also *Private Water Utility.*

Net Income. The excess of revenue (q.v.) over all expenses deductible therefrom.

Net Worth. The residual equity of the owners of any enterprise. In the case of a private utility, capital stock, capital surplus, and earned surplus are the items constituting net worth, while in the case of a municipal utility net worth consists of earned surplus but may also include city equity if the city intends to leave the money contributed to the utility with such utility permanently.

Non-Operating Expense. Expenses incurred in the use of non-operating properties (q.v.) or in the exercise of functions not directly related to the supplying of water.

Non-Operating Income. Income derived from activities other than those directly connected with supplying water.

Non-Operating Properties. Properties which are owned by the water utility but which are not actually used and useful, and are not intended to be used in the operation of the utility.

Notes Payable. In general, an unconditional written promise signed by the maker, to pay a certain sum in money, at a fixed or determinable future time, either to the bearer or to the order of a person designated therein. Preferred to *Bills Payable.* (N.C.M.A.)

Notes Receivable. Negotiable instruments of a promissory nature which are payable to a water utility, either directly or by endorsement. Preferred to *Bills Receivable.* (N.C.M.A.)

Obsolescence. The decrease in the value of assets due to economic, social, technical, or legal changes.

Operating Expenses. Expenses necessary to the maintenance of the enterprise, the rendering of services for which operated, the sale of merchandise, the production and disposition of commodities produced, and the collection of the revenue. (N.C.M.A.)

NOTE: Some utilities commissions interpret the term "operating expenses" in a narrow sense so as to exclude therefrom depreciation, taxes, and property losses chargeable to operations, and require that each of these be classified independently as an operating revenue deduction. In examining or preparing an income and expense statement the sense in which the term is used must be kept in mind.

Operating Revenue. Revenue (q.v.) derived directly from the operations of a utility.

Operating Statement. See *Income Statement.*

Organization Expense. The incidental costs of organizing the utility. Examples are fees and expenses of incorporation and office ex-

penses incident to organizing the utility.

Other Income. See *Non-Operating Income.*

Overdraft. The amount by which checks, drafts, or other demands for payment on the treasury, or on a bank, exceed the amount against which they are drawn. (N.C.M.A.)

Overhead. All those elements of indirect cost necessary in the production of an article or the performance of a service, which are of such nature that the amount applicable to each unit of product or service cannot be determined readily or accurately and are usually therefore allocated on some arbitrary basis. Usually they relate to those objects of expenditure which do not become an integral part of the finished product or service, such as rent, light, supplies, management, supervision, etc. (N.C.M.A.)

Penalties. Amounts added to customers' bills if not paid by a certain date.

Perpetual Inventory. A system whereby the inventory by units of property at any date may be obtained directly from the records without resorting to an actual physical count. An account is provided for each item or group of items to be inventoried, so devised as to show the balance on hand at any date, subsequent additions and withdrawals, and the resulting balance in units and frequently also in value.

Petty Cash. A sum of money, either in the form of currency or a special bank deposit, set aside for the purpose of making change or immediate payments of comparatively small amounts for which it is subsequently reimbursed. (N.C.M.A.)

Posting. The act of transferring to an account in a ledger the data, either detailed or summarized, contained in a book or document of original entry. (N.C.M.A.)

Prepaid Expenses. Expenses which have been entered in the accounts for benefits not yet received, such as prepaid rent, prepaid interest, and premiums on unexpired insurance. (N.C.M.A.)

See also *Deferred Charges.*

Private Water Utility. A water utility (q.v.) owned and operated by private individuals or a corporation.

See also *Municipal Water Utility.*

Profit and Loss Statement. See *Income Statement.*

Property Dividend. A dividend (q.v.) paid in the form of property.

Pumping. See *Water Pumping.*

Purchase Order. A document authorizing a vendor to deliver specified merchandise and to make a charge therefor. (N.C.M.A.)

Purification. See *Water Purification.*

Qualified Certificate. An auditor's certificate in which the auditor states he has not verified certain items or is unable to do so, or that in his opinion the statements do not accurately or fully reflect actual conditions, or that the information furnished him is not considered sufficient to enable him to reach a conclusion. (N.C.M.A.)

Rate Base. An established valuation on which the utility is entitled to earn a prescribed rate of return.

Receipts. What is actually received. It indicates cash (from all sources) unless otherwise described. (N.C.M.A.)

Refunding Bonds. Bonds issued to retire bonds already outstanding.

The refunding bonds may be sold for cash and outstanding bonds redeemed in cash or the refunding bonds may be exchanged with holders of outstanding bonds. (N.C.M.A.)

Register. See *Journal.*

Repairs. See *Maintenance.*

Replacement Cost. The estimated cost of replacing property.

Reproduction Cost. The estimated cost of reproducing specific property new.

NOTE: The difference between replacement cost and reproduction cost is that the former usually refers to the cost of replacing some unit or part of a unit in the plant as for example a machine or some machine part whereas the latter refers to the cost of replacing the entire plant.

Requisition. A demand or request, usually from one department of an enterprise to the purchasing officer or to another department, for specified articles or services. (N.C.M.A.)

Reserve for Amortization. The accumulation of periodical credits made to record the estimated reduction in the value of certain assets which are estimated to be used a specified number of years. The account refers primarily to intangible fixed assets (q.v.).

Reserve for Depreciation. The accumulation of periodical credits made to record the estimated reduction in the value of certain assets due to wear and tear through use and through obsolescence.

Reserve for Renewals and Replacements. A reserve set up to provide for the renewal or replacement of fixed assets when worn out or obsolete. (N.C.M.A.)

Reserve for Retirement of Sinking Fund Bonds. The total of appropriations of net income or surplus representing the amount of cash and other resources which should have been accumulated at a certain date in order eventually to redeem bonds outstanding.

See also *Sinking Fund Bonds.*

Reserve for Uncollectible Accounts. The net accumulation of periodical credits made to record the estimated reduction in accounts receivable which it is estimated will not be collected.

Revaluation. A value, other than cost, placed on certain assets, or on all assets, to give effect to changes in the general price level, or changes in price which alter the value or the cost of acquiring identical assets.

Revenue. Additions to cash or other current assets which do not increase any liability or reserve, nor represent the recovery of an expenditure.

NOTE: If the accounts are kept on a cash basis, the term is synonymous with Revenue Receipts (q.v.). If the accounts are kept on an accrual basis, the term includes revenue, whether accrued or collected. (N.C.M.A.)

See also *Accrual Basis* and *Cash Basis.*

Revenue Expenditures. See *Expenses.*

Revenue Receipts. Revenue collected. (N.C.M.A.)

Schedules. (1) The explanatory or supplementary statements that accompany the balance sheet, or other principal statement periodically prepared from the books. (2) The accountant's or auditor's principal work papers covering his examination of the books and accounts. (3) A written enumera-

tion or detailed list in orderly form. (N.C.M.A.)
See also *Exhibits.*

Serial Bonds. Issues redeemable by installments.

Sinking Fund. A fund established by periodical installments to provide for the retirement of the principal of term bonds and of other bonds specified to be retired from sinking funds. (N.C.M.A.)
See also *Reserve for Retirement of Sinking Fund Bonds.*

Sinking Fund Bonds. Bonds issued under an agreement which requires the utility to set aside periodically a sum which, with earnings thereon, will be sufficient to redeem the bonds at their stated date of maturity. (N.C.M.A.)
See also *Reserve for Retirement of Sinking Fund Bonds.*

Sinking Fund Requirements. The amount needed to be placed periodically in the sinking fund so that the accumulation thereof together with the earnings thereon will be sufficient to redeem sinking fund bonds as they mature.

NOTE: The amount required periodically should be calculated on an actuarial basis or on some other basis if provided by law. (N.C.M.A.)

Source of Supply. All the activities of a water utility which have to do with the collection of water.

Special Accounts Receivable. Accounts receivable (q.v.) resulting from the sale of materials, equipment, or services, other than the supplying of water, to customers or others.

Special Funds. Sums of money or other resources set aside for specific purposes. Examples are money placed in the hands of an agent for the payment of bond interest and amounts set aside for financing extensions or improvement of properties.

Standard Cost. What the cost of performing an operation or producing a product should be when labor, materials, and equipment are utilized efficiently under normal and reasonable conditions.

NOTE: Normal conditions exist when there is an absence of special or extraordinary factors affecting the quality or quantity of the work performed, or the time or method of performing it. (N.C.M.A.)

Stock Dividend. A dividend (q.v.) paid in stock of the company declaring such dividend. In effect the latter involves merely a transfer of surplus to capital stock upon the basis of shareholdings. It results in the shareholder's having more shares of common stock but the same equity in the enterprise.

Stores. Goods on hand in central store rooms subject to requisition. (N.C.M.A.)

Structures. Permanent buildings, and all improvements to land, including dams, distribution reservoirs, impounding reservoirs, tanks, standpipes, etc., used or expected to be used in the operations of the water utility.

Subsidiary Journal. A journal in which are recorded and from which are posted financial transactions affecting only subsidiary accounts.

Subsidiary Accounts. A group of related accounts supporting a controlling account.

NOTE: A typical example is found in the accounts of water customers, which are usually kept in subsidiary ledgers, the total balances of which must equal the balances

in the controlling account in the General Ledger. (N.C.M.A.)

See also *Controlling Account* and *Subsidiary Ledger.*

Subsidiary Ledger. An accounting record containing accounts, called subsidiary accounts, in which are recorded in detail identical, similar, or related transactions. The accounts in the subsidiary ledger support in detail the debit and credit summaries recorded in a controlling account in the General Ledger relating to the same activity or object as the subsidiary accounts. (N.C.M.A.)

See also *Controlling Account* and *Subsidiary Accounts.*

Supplies. Materials which cannot be identified with any product or service and charged directly to it, but which, nevertheless, are needed in the making of such product or the furnishing of such service.

Surplus. The amount by which the assets of a private water utility (q.v.) exceed its liabilities, reserves, and capital stock. In the case of a municipal water utility (q.v.) it is the amount by which the assets exceed the liabilities, reserves, and city equity.

Surplus Reserves. See *Appropriated Surplus.*

Suspense Accounts. Accounts which carry charges or credits temporarily pending the determination of the proper account or accounts to which such charges or credits are to be posted.

Tangible Fixed Assets. Physical fixed assets (q.v.).

Tax Lien. A right which municipal utilities have, in many states, under statutory provisions, to attach specific customers' accounts to the taxes assessed against specific property. Such attachment operates as a claim against the property until the account is paid.

Term Bonds. Bond issues that nominally mature all at one time. In some cases, however, there may be more than one maturity date, such as a nominal serial bond having postponed maturities in only a few late years of its term. Term bonds are usually retired from sinking funds (q.v.). (N.C.M.A.)

Trade Discount. Allowances, usually varying in percentage with volume of transactions, made to those engaged in certain businesses and allowable irrespective of the time when the account is paid. The term is not to be confused with cash discount (q.v.). (N.C.M.A.)

Transmission. See *Water Transmission.*

Trial Balance. A list of the balances of all ledger accounts, with the debit and credit balances shown in separate columns. If the totals of the debit and credit columns are equal, the ledger from which the figures are taken is said to be "in balance." (N.C.M.A.)

Trust Fund. A fund consisting of resources received and held by the water utility, or by a trustee, in accordance with the conditions of an agreement. (N.C.M.A.)

Unbilled Sales. The estimated amount due the utility for services rendered but not billed.

Uncollectible Accounts. Accounts receivable (q.v.) judged impossible, or impracticable, of collection.

Unexpired Insurance. That portion of policy premiums which represents insurance costs for following accounting periods.

Unit Cost. The cost of a unit of product or service. For example, the cost of chlorinating a million gallons of water. (N.C.M.A.)

Unqualified Certificate. An auditor's certificate in which the auditor states that the accounts referred to in the certificate are, in his opinion, correct and reflect accurately the conditions or the transactions or results shown. (N.C.M.A.)

Voucher. A document certifying a certain transaction, especially a written form attesting the propriety of the payment of money. (N.C.M.A.)

Voucher Register. The journal in which vouchers are entered after approval for entry.

Voucher System. A system which requires that every cost incurred be examined methodically by designated officials before approving payment. At some point in the process a voucher is made up showing such information as description of material or service, distribution of items to designated accounts, and the authorization for entry and payment.

Vouchers Payable. Liabilities on open account the propriety of which is evidenced by a voucher (q.v.).

Water Board. The policy determining group of elected or selected persons who have final responsibility for the conduct of the water utility.

Water Distribution. The activities relating to the distribution of water to consumers.

Water District. An entity set up, usually under authority of a state, when the water needs of one or more municipalities are to be supplied from a common source.

Water Pumping. The activities connected with supplying "head" for the distribution of water.

Water Purification. Activities relating to the treatment of water so as to make it more potable, or safer to drink.

Water Transmission. Activities of the water utility in transporting water from the points of collection to the purification facilities or to the point where it enters the distribution system when the water is not purified.

NOTE: 1. The term does not include water purification (q.v.) or water pumping (q.v.).

2. A transmission main is distinguished from a distribution main in that the former is used in conveying water to the distribution system and generally has no service connections.

Water Utility. An enterprise conducted for the purpose of supplying water to customers.

NOTE: A water utility may be either privately or publicly owned.

See also *Municipal Water Utility* and *Private Water Utility*.

Working Capital. Working cash, materials and supplies, and other similar current assets necessary to operate the enterprise.

Work in Process. The cost of partially completed products manufactured or processed in the service departments. The term is not synonymous with *Work in Progress.* (N.C.M.A.)

Work in Progress. The cost of construction work undertaken but not yet completed. (N.C.M.A.)

Work Order. A written order which is a part of a "work order system." This system provides that any work, other than emergency

or routine work, shall not be initiated until proper authorization is transmitted to the person whose duty it is to direct the work. The work order, dated, numbered, and signed, is quite specific as to when and how the work is to be performed, and carries authorization for the necessary labor and materials.

Appendix 2

BIBLIOGRAPHY

The following bibliography consists of five parts as follows: Part 1—Books; Part 2—Articles in the *Journal of the American Water Works Association;* Part 3—Articles in other periodicals; Part 4—Subject index to magazine articles; and Part 5—List of periodicals frequently carrying articles on utility accounting.

Part 1—Books

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Appendix 3

CLASSIFICATION OF ACCOUNTS FOR CLASSES C AND D UTILITIES

The following classification represents a condensation of the classification of accounts listed in Chapter 3. The letter "C" to the left of an account designates the account as applicable to Class C utilities, the letter "D" to Class D utilities. All other accounts are applicable to both classes. Income accounts (501–540), the detailed Operating Revenues accounts (601–616), and the Analysis of Surplus accounts (400–414), have been omitted from this Appendix since they are identical with those recommended for Classes A and B utilities.

BALANCE SHEET ACCOUNTS
(See pages 23–27.)

Assets and Other Debits

A. Utility Plant

100 Utility Plant
100.1 Utility Plant in Service, Leased to Others and Held for Future Use
100.3 Construction Work in Progress
100.5 Utility Plant Acquisition Adjustments
100.6 Utility Plant in Process of Reclassification
107 Utility Plant Adjustments

B. Investment and Fund Accounts

110 Other Physical Properties
111 Investments in Associated Companies.
114 Miscellaneous Investments and Special Funds

C. Current and Accrued Assets

120 Cash and Working Funds
123 Temporary Cash Investments
124 Notes and Accounts Receivable
126 Receivables from Associated Companies or Receivables from Operating Municipality
131 Materials and Supplies
132 Prepayments
133 Miscellaneous Current and Accrued Assets

D. Deferred Debits

140 Unamortized Debt Discount and Expense
141 Extraordinary Property Losses
146 Miscellaneous Deferred Debits

E. Capital Stock Discount and Expense

150 Discount on Capital Stock
151 Capital Stock Expense

F. Reacquired Securities

152 Reacquired Capital Stock
153 Reacquired Long-Term Debt

LIABILITIES AND OTHER CREDITS

G. Capital Stock

200 Common Capital Stock
201 Preferred Capital Stock
202 Stock Liability for Conversion
203 Premiums and Assessments on Capital Stock
204 Capital Stock Subscribed
205 Installments Received on Capital Stock

H. Long-Term Debt

210 Bonds
211 Receivers' Certificates
212 Advances from Associated Companies or Advances from Operating Municipality
213 Miscellaneous Long-Term Debt

I. Current and Accrued Liabilities

220 Notes and Accounts (or Vouchers) Payable
221 Notes Receivable Discounted
223 Payables to Associated Companies or Payables to Operating Municipality
224 Dividends Declared
225 Matured Long-Term Debt
226 Matured Interest
227 Customers' Deposits
228 Taxes Accrued
229 Interest Accrued
230 Other Current and Accrued Liabilities

J. Deferred Credits

240 Unamortized Premium on Debt
241 Customers' Advances for Construction
242 Other Deferred Credits

K. Reserves

250 Reserve for Depreciation of Utility Plant
251 Reserve for Amortization of Limited-Term Utility Investments
252 Reserve for Amortization of Utility Plant Acquisition Adjustments
253 Reserve for Depreciation and Amortization of Other Property
254 Reserve for Uncollectible Accounts
258 Miscellaneous Reserves

L. Contributions in Aid of Construction and Municipal Equity

265 Contributions in Aid of Construction
266 Municipal Equity

M. Surplus

270 Capital Surplus
271 Earned Surplus

INCOME ACCOUNTS

The classification of income accounts is similar to that recommended for Classes A and B utilities. See pages 27 and 28.

SUBSIDIARY ACCOUNTS

I. Utility Plant in Service (Account No. 100. See pages 29 and 30.)

A. Intangible Plant

D 301 Intangible Plant
C 301 Organization
C 302 Franchises and Consents
C 303 Miscellaneous Intangible Plant

B. Tangible Plant

311 Land and Land Rights
311.1 Source of Supply Land and Water Rights
311.2 Power and Pumping Land
311.3 Purification Land
311.4 Transmission Land and Rights of Way
311.5 Distribution Reservoirs and Standpipe Land
311.6 Distribution Land and Rights of Way
311.7 General Land
312 Structures and Improvements
312.1 Source of Supply Structures
312.2 Power and Pumping Structures
312.3 Purification Buildings
312.5 Distribution Reservoirs and Standpipes
312.6 General Structures and Improvements
313 Power and Pumping Equipment

320	Purification System
321	Transmission Mains and Accessories
322	Distribution Mains and Accessories
323	Services
324	Meters
325	Hydrants
326	Fire Mains
327	Other Fire Protection Plant
328	Fountains and Basins
329	Office Furniture and Equipment
330	Transportation Equipment
336	General Plant Equipment
337	Other Tangible Property
341	Utility Plant Purchased
342	Utility Plant Sold

II. CLEARING ACCOUNTS (Account No. 143.[1] See page 31.)

901	Charges by Associated Companies—Clearing or Charges by Operating Municipality—Clearing
902	Stores Expenses—Clearing
904	Transportation Expenses—Clearing
906	Laboratory Expenses—Clearing
908	Shop Expenses—Clearing

III. OPERATING REVENUES

The subsidiary accounts supporting this account are the same as for Classes A and B utilities. (See page 32.)

IV. OPERATING EXPENSES (Account No. 502. See pages 32–35.)

A. Source of Supply Expenses

C 701	Operation Supervision and Engineering
D 701	Operation Supervision and Labor
C 702	Operation Labor
703	Operation Supplies and Expenses
C 704	Maintenance Supervision and Engineering
705	Maintenance of Source of Supply Plant
706	Water Purchased for Resale
707	Other Water Source Expenses
708	Rents
709	Joint Expenses—Dr.
710	Joint Expenses—Cr.

[1] Class D Utilities may find it inadvisable to use clearing accounts 902–8. In that case they will usually need to set up accounts in which the expenses can be recorded directly as incurred. See, for example, Stores Expenses (810) and Transportation Expenses (811), on page 470.

B. Power and Pumping Expenses

C 721	Operation Supervision and Engineering
D 721	Operation Supervision and Labor
C 722	Operation Labor
723	Fuel for Power and Pumping
724	Supplies and Expenses
C 725	Maintenance Supervision and Engineering
D 725	Maintenance of Power and Pumping Plant
C 726	Maintenance of Structures and Improvements
C 727	Maintenance of Power and Pumping Equipment
728	Rents
729	Power Purchased or Transferred—Dr.
730	Power Transferred—Cr.
731	Joint Expenses—Dr.
732	Joint Expenses—Cr.

C. Purification Expenses

C 741	Operation Supervision and Engineering
D 741	Operation Supervision and Labor
C 742	Purification Labor
743	Purification Supplies and Expenses
C 744	Maintenance Supervision and Engineering
D 744	Maintenance of Purification Plant
C 745	Maintenance of Structures and Improvements
C 746	Maintenance of Purification Equipment
747	Rents
748	Joint Expenses—Dr.
749	Joint Expenses—Cr.

D. Transmission and Distribution Expenses

C 751	Operation Supervision and Office Expense
D 751	System Operation
C 753	Operation of Transmission and Distribution Lines
C 754	Operation of Meters
C 755	Services on Customers' Premises
C 756	Maintenance Supervision and Engineering
D 756	System Maintenance
C 757	Maintenance of Structures and Improvements
C 758	Maintenance of Mains
C 759	Maintenance of Other Distribution Plant
760	Rents
761	Joint Expenses—Dr.
762	Joint Expenses—Cr.

E. Customers' Accounting and Collecting Expenses

780	Meter Reading, Accounting, and Collecting
784	Uncollectible Accounts
785	Rents

F. Sales Promotion and General Expenses

	786	Sales Salaries and Expenses

G. Administrative and General Expenses

	791	General Office Salaries
C	793	General Office and Miscellaneous Expenses
D	793	General Expenses
C	794	Management and Supervision Fees and Expenses
C	796	Legal Services
	797	Regulatory Commission Expenses
C	798	Insurance
C	799	Injuries and Damages
C	801	Other General Expenses
	802	Maintenance of General Property
	803	Rents
	805	Franchise Requirements
	806	Duplicate Miscellaneous Charges—Cr.
	807	Administrative and General Expenses Transferred—Cr.
	808	Joint Expenses—Dr.
	809	Joint Expenses—Cr.
D	810	Stores Expenses [2]
D	811	Transportation Expenses [2]

V. Analysis of Surplus Accounts

The classification of Surplus accounts is similar to that recommended for Classes A and B utilities. See page 35.

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[2] Should be kept by Class D utilities that are not using the optional clearing accounts, Stores Expense (902) and Transportation Expense (904). See footnote on page 468.

Index

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